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LECTURE UPON CEYLON TEA.

"FROM THE TEA SEED TO THE TEA CUP."

By Alfred Ames, Late Planter of Ceylon.

Written for Switzerland.

Illustrated by Lantern Views.

IN the year 1800 the United Kingdom consumed 1¼ lb. of tea per heal of population. In 1900 5½ lb. of tea per head of population was consumed.

In 1800 the consumption was

............20,358,827 lb,
„ 1850..............51,000,000 lb.
„ 1900..............303,867,149 lb.

Up to the year 1862 nearly all the tea consumed came from China. The year 1879 registered the high-water mark of China teas, since which time the importation has gradually decreased, the teas from India and Ceylon having almost entirely overthrown the monopoly of that country.

Every day the two islands consume 600,00C lb. of tea which approximately represents 4,000,000 gallons or 120,000,000 cups of tea, or about 3 cups to each person. Indeed the United Kingdom cousumes nearly as much tea annually as the whole Continent of Europe, North and South America, Africa and Australia. The British nation has every right, I think you will admit, to consider itself a connoisseur upon the subject of tea. It not only grows the best tea, but drinks the greatest quantity of it. No better guarantee of quality could be given by any manufacturer than the fact that he is the best customer for his own goods.

To commence from the beginning, from the tea seed, arriving eventually at the tea-cup, will necessitate a description of the various processes employed to produce good tea to drink, and also gives one an opportunity to describe the country in which the best tea is made. I daresay you have all heard how tea became to be the chief product of the sweet-scented Island of Ceylon. Coffee had for many years been the principal export, the others being cinnamon and other spices, coconut oil, etc, the minerals being represented by precious stones such as sapphires, cat's-eyes, moonstones, and last but not least the very useful and humble plumbago of which there are many mines in many parts of the country. In the middle of the seventies a disease was discovered upon the coffee tree of a most virulent description, which gradually attained such ascendency, as in a few years to completely change the whole aspect of the coffee districts.

Where fields had yielded 10 or even 15 cwt an acre, only a few dried sticks were left to mark the place of former prosperity. This disease was called "Hemeleia vastatrix," and was really a consumption of the lungs of the leaves which after being attacked fell to the ground in decayed heaps, and the fruit without nourishment from the atmosphere failed to mature and ripen. Although as I say the process was gradual, the result to proprietors of Estates was appalling and sudden. It behoved all Ceylon planters and those interested to use their best endeavours to find a substitute that would enable them to maintain the prestige of the island. For this purpose everything was done that human ingenuity could devise. Tropical Agriculturist books were earnestly investigated. Kew Garden's experts were appealed to, and every conceivable plant likely to produce a paying crop was experimented with; but as a satisfactory substitute for coffee, they all more or less failed; representing a good illustration of the well-known fable of the fox who beasted of his nine tricks, whilst the success of the tea industry might be compared with the one trick possessed by the historical cat; the sequel proving that the latter was worth all the other nine put together.

Liberian coffee, cocoa, cinchona, cardamoms, pepper, vanilla, cinnamon, coconut, etc., have by careful cultivation given a good profit to proprietors, although

some of these labor under the disadvantage of supply exceeding demand, the market becoming easily over-stocked.

Cocoa, Liberian coffee, and cinchona will only pay to grow under certain conditions of climate and soil, and therefore could not be considered a satisfactory substitute for the defunct coffee tree. The great substitute however was discovered. Difficulties were overcome, dead coffee trees were sawn down or the roots grubbed up to make room for the new seedlings.

Thousands of acres of jungle useless for growing the old product were promptly felled and planted up with the new. No land seemed to be too high or too low to accommodate the tea plant, no soil too rich or too poor to produce a luxuriant crop of tea. From the year 1882 the whole aspect of the island was changed. Huge tracts of land were opened up and factories built.

In the early days of tea planting the manufacture was entirely carried out by hand. In course of time howover this was disoovered to be inadequate, and machinery of all sorts and sizes was resorted to. The nett result has been that Ceylon hand in hand with India has practically rushed China tea out of British consumption.

The three great growing centres of tea are China, India and Ceylon. British subjects should without doubt deal in preference with the two latter rather than with the former, if alone on patriotic grounds; and thay have loyally done so, but the principal cause of China's defeat upon British territory has resulted from an economical motive. it was discovered that the British-grown teas go very much further than *China*. That is to say, *two* spoonfuls of India or Ceylon tea provide as many cups of teas as *three* spoonfuls of China.

The London Custom Report says:—

"From the information which has been afforded us on the subject, we believe that we make a moderate estimate in assuming that Indian tea goes half as far again as China tea, so far as depth of colour and fullness (not delicacy of flavour) are concerned. Thus 1 lb. of Chinese tea produces 5 gallons of tea of a certain depth of colour and fullness of flavour. 1 lb. of Indian tea will produce 7½ gallons of a similar beverage."

This report clearly proves that there is a direct saving in the use of British-grown teas. Surely a saving of ⅓ or 33% should appeal to the economical Swiss housewife.

"*Demand controls supply*, and it will only be when the small purveyor finds that his customers will no longer drink the China rubbish they have hitherto tolerated, that the great change will take place, exactly in the same way as it did many years ago in England.

In point of fact the reform will take place when the Swiss tea dealer comes to have more faith in English houses than he has in those belonging to Hamburg Jews.

Another great argument in favour of British-grown teas is the extreme cleanliness observed in their manufacture. Any stranger may see the whole process from the beginning to the end, the plucking of the leaf, the weighing of the same at the store, the withering at the factory, the rolling, the fermentation, the roasting and sifting of the manufactured leaf, the packing in lead lined cases, and if he so chooses he can see the cases placed in the bullock carts and despatched, marked and hoopironed, to the nearest railway station. A visit to a tea factory unmistakably proves that every process through which the tea passes is a *cleanly* one. It is not too much to say that after the green leaf has been once plucked by the coolies *the tea is never allowed to be handled*. Here is a quotation from Mr. Cave's book on Ceylon: "Everything it will be observed is done to avoid handling the tea indeed from the bush to the tea table, such methods of pure cleanliness are observed as scarcely any other food manufacture can claim, and especially do these methods of Ceylon tea manufactures stand in contrast to those of China, where the primitive operations employed are such that the stomach would rebel against a detailed description I am convinced that if the public generally did but realize this difference between Ceylon tea and that of some other countries the demand for the Ceylon article would increase quite beyond the capacity of the country to produce it." What Mr. Cave says is quite true. The most perfectly clean machinery and storage of all descriptions is employed, and it is quite a pleasure and one not easily forgotten to see the whole process in operation. The Chinese on the other hand are very jealous of strangers visiting their gardens. They do not employ machinery but use only their hands and feet for the manufacture of tea. "Ah Sin" has no occasion to pay labour to assist him, his wife and olive branches being sufficient for the very small acreage for which he is responsible. After his tea has passed through an exceedingly unpleasant process, which consists of rolling, breaking, and squeezing the leaves until the juice exudes through the fingers, perhaps not overclean when he commences, but perfectly so by the time he has finished; it is then fermented and we hear is put into a copper pan and afterwards roasted upon primitive trays over a slow charcoal fire. When the process is in all its branches—we do not know or want to know—only a suggestion occurs to one that the *earthy* flavour so very apparent in China teas, is not alone attributable to the constituents of the leaf. The middleman in the tea growing centres of China is a very important person, he buys the leaf manufactured from the peasant grower, and after sorting and sifting it in to large breaks, packs it into the cabalistic cases so familiar to everybody. The tea is then carted to the great centres where it is bought for English or Russian houses and shipped to over-sea ports or despatched by caravan routes to Russia.

In looking at the tea growing centre of Ceylon upon the map, and considering the magnitude of the industry, we are surprised to see what a small area it occupies in relation to the rest of the island, which is about the size of Ireland. Ceylon from both in historical and agricultural point of view is one of the most interesting spots upon the face of the globe. The population is composed of Europeans, Sinhalese, Jaffna Tamils, Moors, Parsees, Portuguese, Afghan and Malays with a sprinkling of people from many other countries. The Sinhalese and Jaffna Tamils are the natives proper of the country. The latter occupy the extreme north of the island where they were driven by the victorious Sinhalese after one of the many dynastic wars between the two races.

The Sinhalese peasants object to work as a coolie, being perfectly able to support himself and family upon his patch of rice and garden, to watch him ploughing in with his two buffaloes, who drag a sharp stake through the mud of the paddy-fields; forces the mind back a couple of thousand years, there is little doubt the passage of time has suggested no improvements in field culture to this veritable child of Nature. Lately the wealthy Sinhalese have taken up tea cultivation with the result that the labor class is gradually taking to the work and it is calculated represents about 7% of the wage-earning population. The scenery of the island is magnificent and reminds one very much of Switzerland; there are several mountains ,but not nearly of the same altitude as the high ones of this country. "Pidurutalagalla" is a little over 8,000 ft. whilst the celebrated "Adam's Peak" is only about 7,000 feet. This mountain is by 800,000,000 of people considered one of the most scared spots in the World, it is to the Buddhist what Mecca is to the Mahommedan, and thousands of the faithful annually visit it on

pilgrimage. Curiously enough the Mahommedans and Hindus equally hold the mountain in veneration; the former think the well known foot-print upon the summit is that of our common parent from which superstition the Peak derives its name. The Hindus credit their god Siva with the impress, whilst the Buddhists, of course, reverence the foot-print as that of their holy Gautama.

The great working or cooly race is that of the Tamil, from the coast of Malabar; their lot in their own country in the time of famine is so hard that they are glad to emigrate anywhere for a certainty of shelter, a plentitude of rice with regulary paid wages.

The constantly recurring loss of the rice crops, due to the paucity of rain, has caused much distress and loss of life through starvation. By giving regular work and wages, our tea gardens have saved the lives of thousands of our fellow-creatures, surely an additional reason to look kindly upon an industry which has prevented so much suffering. The Tamil cooly is a patient, hard-working representative of humanity, he will work under a tropical sun for 10 hours at a stretch for 5½d. his wife for doing the same being quite content with the equivalent of 4d. in English money, his children find employment as pickers. Although of course he cannot make any considerable amount of savings he will sometimes return to his coast and buy a cow which to him spells affluence, or he will start himself as kangani or small headman, by degrees collecting a labor force to manage which insures him a competency, and what is still more to be desired enables him to superintend the work without working himself, which consists in standing upon a rock and dividing his time between chewing "*betel*" and shouting at the coolies. Kanganies who are not paid wages are paid each day so much for each cooly in their gang who comes to work. The system adopted by recruiting labor is called "Coast Advances." A sum of money is advanced by the Superintendent to his kangany who straightway returns to his village on the coast of India, and there in his turn advances so much to each cooly who is willing to return with him to the estate and work in his gang, thus a cheap labor force is constantly replenished, and it is no doubt greatly owing to this fact that the success of the tea industry is due. *Cheap labor and cheap transport* are both obtainable in Ceylon, without which, however suitable *climate, rainfall or soil*, no tea garden could by any possibility be made to pay, either in Ceylon, India or elsewhere.

It is generally supposed that Ceylon with its wonderful soil and climate produces a golden harvest of all kinds of fruit without the necessity of cultivation. *This is not so.* Only a few fruits even when cultivated are fit for European digestion: there are of course the well known *Mango, Plantain, Pineapple, Pomegranate, Mangosteen* and *Orange*, and that is really about all. The pineaple indeed is sometimes grown to an enormous size, weighing as much as 32 lb. and as delicious in flavour as abnormal in size. *The best fruits are carefully cultivated* and it is quite a mistake to suppose that they grow *wild* in the jungles. I mention this fact relative to Ceylon fruits as partly accounting for the downfall of King Coffee.

Coffee being a *fruit* crop was only kept going by *high cultivation*, the ground was manured heavily year after year, until the fruit-bearing power reached its climax, and the over-taxed trees became an easy prey to the fell disease which eventually caused their destruction. The grape vine suffers from a very kindred disease to the "Hemileia" of the Coffee, in fact it appears to be an impossibility to force a heavy fruit crop year after year from the same trees, without compelling their destruction, in plain language we take more nourishment from Mother Earth than any system of manuring will enable us to replace.

Tea is not a *fruit* crop but *leaf* crop, the natural tendency of all vegetable life in the forcing climate of Ceylon is to run to *leaf*. *Therefore tea is a natural crop.* We only ask from the tea tree what it can well afford to part with. The tea tree, it is true, throws out a beautiful blossom like a small single Camelia, to which family it belongs, but should there be too much seed upon the trees it is a sign that the "Jat" or quality of the tea is not good. The best tea throws out the least seed.

The difference between the two crops *coffee* and *tea*, being understood, it is not difficult to understand why planters have been so successful with the latter. The former exhausted the soil, the cultivation of the tea crop does not do so, it represents a bill of exchange upon the soil, which is always *paid when due and without difficulty.* The tea tree only requires careful pruning and management to bring its leaf crop to perfection. So rapid is the growth of the tea flush that on a properly managed garden the pickers have only time to finish the last field when the first will be ready to recommence upon, the flush takes about 8 or 10 days to grow. The tea planter has little reason to fear the ravages of the numerous pests which have helped to rob the Island of its magnificent coffee crops. No disease has yet appeared to interfere with the ever-growing export of tea from the port of Colombo, there is no apprehension as to that. The real problem to solve is *what is to be done with the surplus of tea which cannot find an outlet in* Mincing Lane? This important question has brought me before you to-day and will be discussed later on. It is one that must sooner or later affect consumer as well as producer. British-grown teas have still to replace those of China on the Continent of Europe and America; this is the special mission of the House I represent, Messrs James Finlay & Co. of Glasgow, with whom are incorporated Finlay, Muir & Co. in the East and Rogivue & Co. Ld. on the Continent of Europe. This great firm has houses in all parts of the world—Glasgow, London, Calcutta, Colombo, Bombay, New York, Chicago, Toronto, Moscow, Constantinople, Magdebourgh, Lausanne, etc. and has altogether seventy thousand (70,000) acres under tea in Assam, Sylhet, Cachar, Darjeeling, Travancore and Ceylon, besides a considerable area under coffee, cocoa, cinchona, cardamoms, etc. The produce from their tea gardens last year amounted to 22,000,000 lb. of manufactured tea, this converted into cups of tea at the rate of 200 for each pound *of tea would make four thousand four hundred million* (4,400,000,000). Before describing the processes of tea cultivation it would be as well perhaps to study the chemists' analysis of the tea leaf. We have all noticed that there are times when nothing refreshes us so much as a cup of tea. No other beverage possesses this wonderful quality. Nothing in this world can ever replace the afternoon cup of tea, it is the only stimulant which cheers without exacting reaction. To what special property in the leaf is this due?

The constituents of the tea leaf are fifteen in number, but all with the exception of three are of small importance, these three are:

The Essential Oil,
Theine or Caffeine, and
Tannin.

The Essential Oil gives to the tea its flavour and aroma. As regards Theine in India or Ceylon teas there is sometimes as much as 6 per cent whilst in China tea only about 1 per cent is found. The higher the percentage of Theine or Caffeine the greater is the beneficial effect on the human system; this is evidently the invigorating agent. The Tannin in tea is the chief cause of its strength and pungency; it is however probable that the fulness of the tea apart from the pungency is due to the mucilagenous constituents dissolved by the boiling water. With regard to the great Tannin question it is a subject which has been much discussed but little understood. Indian and Ceylon teas are stronger in liquor than China teas, this although distinctly in favour of the former

has been used as an argument for their disparagement, it is simply a case of dealing with the teas according to their strength.

Ceylon teas should only be infused for five or six minutes after which time the made tea should be poured off into another tea-pot heated for its reception. If this were always done we should hear no more about Tannin which in properly made tea only adds as the analyst remarks strength and pungency to the liquor; fresh spring water should bo employed, and water that has once been boiled should not be reboiled for tea making. Of course, it is necessary to procure a good sound tea, and for this purpose you have only to apply to any of the numerous agents of Rogivue & Co. Ld., to obtain what you require.

Tho most delicate tea is grown at high altitudes whilst magnificent crops are produced from the low country gardens. The curious characteristic of Ceylon tea is that at whatever the altitude it is grown it can always be drunk *unblended*, it is a *self-drinking tea*, and does not require the agency of any other tea to make it enjoyable or drinkable. It is however about time to think of the tea seed if we are ever going to arrive at the tea-cup.

After a block of jungle is *bought, felled and burnt* it must be first well roaded and afterwards holed for the reception of the young tea plants, which are planted from three to four feet spart according to the altitude of the estate. A Nursery must first be prepared for the reception of the tea seed, well screened from the sun by Palm leaves or dried mana grass. This nursery it is needless to say is a most important part of the undertaking. On a large nursery it is quite one man's work to watch and water the seedlings and keep the ground clear of insects, pests, weeds, etc. The tea plant when about nine inches high only requires the rains to commence for planting out. The young plant is then gently extracted from the soft earth of the nursery, tied up into bundles and served out to the most experienced coolies to plant in the holes prepared for their reception. These holes are dug to the depth of about 12 inches and should be filled in with surface soil carefully freed from stones or rough subsoil. Planting is a most important operation and requires great care; should the long tap root get bent the future prospects of the tree will be greatly affected. The rainfall in the low country is about 180 inches per annum, about 6 or 7 times as much as London registers, as much as 6 inches of rain will sometimes fall in a few hours, this humid atmosphere coupled with the forcing properties of a tropical sun produces a wonderful growth in the tea fields, the first picking of the leaf often taking place within two years of planting. In the higher altitudes the rainfall is less and the growth not nearly so rapid, three to four years is generally allowed to elapse before the first crop is plucked. The general management of the tree will much depend upon altitude and climatic differences. The rougher teas from Assam or the Kelani Valley naturally require different treatment to the high-grown and more delicate sorts, it is not altogether unlike the high and low born of the human race, both are necessary but require separate modes of treatment to procure the best results. This is supposed to be a popular lecture on CEYLON TEA so that I shall not weary you with statistics. After I have finished my remarks upon tea cultivation and discussed with you other important points, there will be thrown upon the sheet a number of beautiful photographs taken by Mr. H. W. Cave of Ceylon. If the lecture should have proved a little dry I sincerely trust these pictures will dissipate any weariness acquired during the relation of details a little monotonous perhaps but necessitated by the subject.

The coolie women and children become very expert in plucking the leaf, it is marvellous to watch their dexterity, it seems to be an instinct with them to know what part of the flush should be taken and what felt for future use. The eye in the axil of the leaf must not be injured as that represents the future flush. The top leaf or bud of the shoot is known in the trade as "tippy" tea, this is a small orange-coloured leaf found in high class teas, easily distinguished amongst the black leaves by its golden appearance, this leaf makes the best tea and would be too strong in liquor to drink by itself unless used sparingly, a single pound specially picked has fetched in Mincing Lane as much as £35 stg. These fine leaves are collected by throwing the tea against a special matting made of jute, the extremely small tips stick to it whilst the heavier leaves fall to the ground. *The Orange Pekoe, the Pekoe and Pekoe Souchong* are the next in sequence down the stem of the flush. There are two kinds of plucking; fine and coarse, the former turns out teas as follows :—

Broken Orange Pekoe	...	Equal	30 per cent
Orange Pekoe	... ..	do	40 do
Pekoe	.. .. ..	do	19 do
Pekoe Souchong	.. ..	do	7 do
Dust	.. ..	do	3 do
Wastage	.. ..	do	1 do

the coarser picking would include a higher percentage of the Pekoe Souchong leaf. After plucking the leaf the coolie carries his or her basket to the central store where it is carefully weighed and placed in the withering rooms. The withering process is very simple, the leaves are spread out thinly upon "Tattu" or shallow trays, and left until they become properly withered, sometimes hot air is passed through the shed, but this is mostly resorted to when the weather is wet and the leaves in consequence refuse to dry, the leaf when ready for rolling should feel to the touch like a dry rag. This is a very important part of tea manufacture, as unless the leaf is properly withered it is quite impossible to roll it. After the withering the leaf is taken by trained coolies to the rolling machine, a marvellous instrument which roll and crushes the withered leaf into the fine spiral form so well known. After rolling comes *Fermentation*, the crushed leaf is placed in flatish heaps and covered with wet cloths until it becomes a *bright coppery colour*. Machinery having done its duty up to this stage, human intelligence must for a short time take its place. It is the *fermentation* of the leaf which is the *most important part of the tea manufacture*. During this process the *chemical properties of the leaf are changed*, the point is to know exactly when this change has taken place, and consequently the right moment to break up the fermentation, and consign the tea to the Dessicator or roasting machine. To gain this experience a long course of close application to the subject is necessary, however careful one may have been in the other parts of the manufacture, carelessness with the fermentation will spoil the whole day's work and not only lose a valuable lot of tea, but should the tea, so spoiled be shipped to London and receive an adverse criticism from the trade, the estate in question may get a bad name which would effect its sales of tea for a considerable time perhaps. In the very early days the proprietors of one garden nearly killed the prospects of Ceylon tea by sending to Mincing Lane samples which were discovered to be quite unfit to drink. There was a good deal of joking about this at the time but fortunately no real harm resulted. In these early days tea was made entirely by hand. Although a tea roaster was invented by a near relation of mine, which if it had been preserved might now have proved of considerable value to a museum set apart for showing the early efforts of the pioneers, who without guidance resorted to their inborn ingenuity and pluck for devising means for tea manufacture all honour to them say I, and I feel sure that you will agree to the scentiment. After the leaf is roasted, it is sifted into the different qualities required and packed into chests, half chests or boxes for the London Market.

A chest contains from ; 80 to 100 lb. of tea.
A half chest ... ..about 50 lb. and
A box .. .. 20 lb.

We have had up till now I hope a pleasant canter across the green sward of the subject of my lecture. We will now with your kind permission turn to the question raised a few pages back on the struggle for the mastery between British-grown and China teas, viz., which of them will finally obtain the *tea supply of the world*, is it to be India and Ceylon on the one hand or China on the other?

Last year's Imports into the United Kingdom were as follows:

India	156,968,149·
Ceylon	115,322,673.
China, etc	31,576,327.
	149. 303,867,

One of the most striking episodes in the annals of modern commerce is the struggle between these countries for the tea supply of the world. As regards the consumption in Great Britain the result of that struggle is no longer doubtful. The Indian and Ceylon tea grower has won the battle. During the past twenty years he has displaced China teas in the British Market to the extent of 83,000,000 lb. In 1880 Great Britain consumed nearly 115,000,000 lb. of China teas, last year she consumed only 31,000,000. In 1880 Great Britain consumed only about 44,000,000 lb of Indian and Ceylon teas, last year she consumed 272,000,000 lb. While therefore the total British consumption of tea has increased by nearly 145,000,000, during the past 20 years, her purchases of tea from India and Ceylon have increased by 228,000,000 and her purchases from China have decreased by nearly 83,000,000. *The Times* in a leading article upon the subject says:—"This great Industrial revolution has been accomplished by an international rivalry almost without parallel in the history of the world. British enterprise has been doggedly met by Chinese persistence. British energy and dash against the inertia with which the Celestial clings to an established livelihood, however slender the subsistence which it yields. But Ceylon has taken a rapidly increasing share of the battle till it has now become a struggle beeween British enterprise in Asia and the Chinese power of endurance. It now stands revealed as a gigantic struggle between the *East and West*, and between the *ancient and modern* organisation of industrial life. Like all such struggles it ultimately resolves itself into a question of quality and price. It only takes a nation about ten years to get rid of its taste for bad teas, and to acquire a preference for good ones. As regards quality China has not a chance against India and Ceylon. Her rule-of-thumb methods produce an article inferior in flavour and in high class strength to that which the scientific appliances, the costly machinery, and the chemistry of arrested fermentation enable the British tea planter to send to the market. It is therefore no longer in the *British Market* but in the *market of the world*, that the struggle must be fought out. The British Planters whether consciously or unconsciously have practically acted on the principle that they had to pretty nearly kill the China tea trade in Great Britain, if they were to secure an adequate expansion for their own industry. They have as shown by the returns already cited *pretty nearly killed* it; and they are doubtless determined to go on with the struggle to the end. It is as we already said ultimately a question *of quality and price* and although the British planter has come off victorious, figures show the loss in price which the struggle has cost him. It is clear that the further displacement of China tea in Great Britain alone will not offer an adequate outlet for the rapidly increasing production of Indian and Ceylon Teas. But even if the British planter succeeded in displacing that quantity of China tea in the British Market he would still require to find new outlets for the additions which are being yearly made to the ta exports from India and Ceylon. To find these new markets outside the United Kingdom I repeat is the special mission Messrs. James Finlay & Co. have undertaken to pursue and to devote their great influence and large capital to this end. It is for this purpose that Mr. Maurice Rogivue, Director-general of Rogivue & Co., Ltd., was chosen by the Planters' Association of Ceylon to represent the Ceylon Tea Industry in Russia. It is now many years since this redoubtable champion of Ceylon tea was honored by this confidence. He went to Moscow and there started a great number of depots and year by year has enormously increased the sale of Ceylon tea, displacing China Teas to the extent of 17 millions of pounds in 10 years and gradually forcing a path through the strong prejudices of the conservative Russian Tea drinker in favour of British grown teas. The land of the Turk has not beeen forgotten and a very large trade is being strongly pushed by Mr. Rogivue in Constantinople. It is now many years since I arrived in Switzerland also for the express purpose of introducing the teas grown in British Territory. Twelve years ago in Montreux it was almost impossible to procure Ceylon tea, and I believe the local Banker was almost the only medium for the supply of Indian tea in small packets. We have now about a dozen agents in Montreux who sell our Ceylon teas. Your humble servant was also one of the first Kelani Valley Planters and was also one of the first few to start the sale of tea in England. Myself and Partner represented Ceylon tea at the Healtheries Exhibition in 1884. I daresay some of you will remember our Sinhalese Bungalow in the gardens. We served out to the British Public very often as much as 2,000 cups in one day of the until then unheard of Ceylon Tea. It is needless to say this Bungalow acted as a splendid advertisement. The following year 1885 we shipped it over to the Antwerp Exhibition for the purpose of introducing Ceylon Teas into Belgium. At the Chicago Exhibition the Ceylon Planters provided a fund of £21,000 stg. to push their teas in the United States, the Indian Planters expended £7,000 stg. on the same purpose. The results were most satisfactory. British grown teas for the first time were brought within the knowledge of the American consumer. Next to Great Britain the United States is the largest tea purchaser in the world, but unfortunately the 100,000,000 pounds which they take are almost entirely obtained from China and Japan. Indeed the American taste for tea has been formed upon the coarse leaf of these countries and the fine flavoured Indian and Ceylon teas were a new revelation to most of the visitors at Chicago. 1,500 of the largest American tea firms immediatly sent orders for British grown tea and the Ceylon Planters opened a central permanent depot for their teas in Chicago itself.

The amount of British Capital invested in tea gardens is about £30,000,000 stg. It is not to be wondered at that the proprietors of this huge undertaking are anxiously looking about for new customers for their ever increasing yield. In the year 1883 Ceylon bashfully sent to Mincing Lane 1,000,000, pounds of its new tea, in 1900 it plumped down over 115,000,000 at the door of the London Custom House. Such astounding assurance has met with its proper reward, for instead of the goods being returned with thanks as no doubt the aforesaid "Ah Sin" thinks would have been the proper course to pursue, the teas were actively competed for and found a ready market. From the days of its Cadetship Ceylon has grown into a fully equipped fighting soldier who in conjunction with India having fought "a la mort" for the possession of the London market with China, has had many a friendly round with its Indian neighbour, but the contest has always been fought with "gloves," and there is every reason to believe that in future only a friendly alliance supported by identical interests will exist between the two great British tea producing countries. This alliance will

no doubt have for its object the regulation of quality and consequently to a great extent of prices on the London Market by carefully restricting supplies and shipping only a class of tea calculated to increase the demand. It would prove a great misfortune if competition for cheap teas from British gardens, the quality as it has done with cheap China teas, some of which are not fit for human consumption. There is little doubt that magnificent China teas were sold to the general public half a century back, but then the price paid was enormous and the profit on the sale equally so. Now English people have been taught to believe that the best tea the world grows is not worth more than 1s. 7d. per pound at their grocers. This is not true, it is also most unfair on the producer who finds more and more difficulty in getting rid of his really fine Orange Pekoes at a fair price, the public taste for tea is not what it was a generation back, the evil has however to a certain extent cut both ways and it is quite true that one can now a days buy a sound drinkable tea at a much lower price than the last generation would have thought possible.

Before concluding I should like to make a few remarks upon the different names given to tea. In the days when China was the only country that grew tea it was known by such names as Pekoes, Souchongs, Congous and many others which have now almost lost their meaning to the general public such as: Gunpowder, Bohea, Hyson and Twankay, even the more modern names of Kaisow, Lapsaug and Moning are far less common than they were ten years ago. The pioneer planter in India thought it would be more convenient to continue using the names most familiar to the public and to carry out this idea he divided the flush or green shoot into different sections, each section was supposed to resemble one of the well-known China sorts. The China tea plant was discoverd 5,000 years ago, it is known to have been used as tea 12 centuries back.

Manufactured tea was introduced into England during the reign of the merry Monarch..China seed was used largely when the first gardens were planted up in India and was employed in Ceylon as far back as the year 1842. The great discovery of the indigenous plant growing wild in the jungles of Assam completely changed the order of things. Some people contend that it was a botanist who first discovered this plant, whilst others say it was a common garden coolie. However that may be the two varieties hybridized very quickly and produced a useful flush-giving tree which was called "Assam Hybrid" and which has for a number of years been the chief tea of commerce. In some altitudes the indigenous yields much better in its natural condition and it now appears to be a serious question amongst planters whether it was not a mistake in the first instance to blend it with the Chinese variety.

I have now finished my remarks upon tea planting and Ceylon generally. It is a marvellous country with a marvellous history. In the early days of British rule the annual imports amounted to about £250,000, stg. they are now about £5,000,000 stg. In the early days there were no Banks no good roads or bridges. Very few schools, no hospitals, only four post offices and no newspapers. There are now 14 important exchange and deposit Banks, and Banking Agencies doing an annual sum of business amounting to about R69,000,000. 1,500 miles of splendid metalled roads, countless good bridges, more than 2,000 schools. Upwards of 100 hospitals and dispensaries, 250 Post Offices, 36 Newspapers and Periodicals, and nearly 5,000,000 acres of land under cultivation. The shipping entered and cleared in the course of the year amounts to nearly 6,000,000 of tons as against 75,000, in the early part of the century.

The Island is also becoming a net-work of mountain and seaside railways and both commercially and socially was never better off than it is at the present moment.

ALFRED AMES.

Lausanne, August 1901.

A PRELIMINARY NOTE ON THE ENZYME IN TEA.

During the past few months we have heard a great deal as to the occurrence and practical value of the enzyme in Tea. In view of the work which is now being done on this subject in India, Japan and Ceylon, it was thought advisable to lay before the planting community a brief statement as to the nature of the enzyme and the methods of manufacture, which may be suggested in order to allow full activity of the enzyme, if this be desired.

In India, Mr. Mann and Mr. Newton have contributed much to our present knowledge of the subject. Mr Newton has suggested the application of an external enzyme to improve the flavour of tea, but in the absence of definite knowledge as to the relations between enzyme and flavour, his suggestion may perhaps be regarded as a little premature.

Mr. Mann has made many useful experiments on the substance in question, and bases his deductions entirely on the varying intensities of blue obtained with gum guiacum on a watery extract of the enzyme. He concludes, that it is doubtful whether it would be possible to add enzyme to leaf of low quality in order to improve the quality, and draws attention to the recognised fact that the enzyme would be no good if the substances on which it had to act were not present. There are, however, several general statements to which we shall take exception, particularly those referring to the distribution of the enzyme, the absence of any knowledge as to what flavour is due to, and the statement that the maximum quality is to be correlated with the maximum amount of oxidase. These will be dealt with at length in a paper to be published later.

Azo of Japan has also noticed the presence of the enzyme in tea, and explains the oxidation and colouring of black tea as a consequence of the oxidising action of the enzyme. This has long been held to be the case in Ceylon and everywhere. In our preliminary note it will be as well to explain what is really understood by the word "enzyme." For our purpose, we may describe a plant enzyme as a substance existing in the sap, and which is capable of inducing chemical changes necessary for the life of the plant. As an instance we may quote the commonest of plant enzymes, known as diastase, which has the power to convert the reserve starch into a soluble sugar, which can be conveyed to the growing parts of the plant. In the leaves of tea, up to the present no starch has been found, so that the action of the tea enzyme *in the leaf* is of a nature different from the above. Nevertheless, its function, that of rendering insoluble bodies into a soluble form, is probably similar to other enzymes.

The presence of an oxidase is usually determined by the reagent known as gum guiacum. This is a resin, soluble in alcohol, and capable when in contact with certain oxidising and other reagents, of acquiring a brilliant blue colour. It has been used for many years as a test for enzymes and other oxidising bodies, but it does not afford conclusive evidence as to the presence of an enzyme. There are very many other bodies which give the blue reaction with gum guiacum alone, the most notable being the oxidising reagents:—potassium permanganate, nitric acid, potassium nitrate, potassium chromate, hydrogen peroxide, ozone, iodine and chlorine. What is most surprising, however, is the fact that the blue colouration may be obtained by means of an aqueous solution of old ferrous sulphate. Further, Reynolds Green *page 397*, states that even albumen, peptone and other native proteids as well as gelatine, give the same blue reaction.

It is therefore obvious, that before one can use the test as a means of detecting an enzyme much work must be done. In the first place, all the oxidising substances mentioned above can be neglected, since they do not occur in a free state in the

plant. It was necessary, however, to isolate the enzyme from the tea leaf, and to obtain it free from impurities, or substances with which gum guiacum gives the blue reaction. This has been done, and the blue colouration obtained when gum guiacum and the practically pure enzyme are brought into contact. We therefore believe that for our purposes the test can be used for the detection of the enzyme in tea leaf, and all our statements are based on observations of reaction, with this reagent.

OCCURRENCE OF ENZYME IN THE TEA PLANT.

All our experiments show that the enzyme occurs most abundantly in the young leaf, but is also present in old leaves and most other parts of the plant. It does not occur in definite decreasing proportions as one passes from the youngest to the oldest leaf, it being often more abundant in the second than the first leaf, and occasionally exhibiting a very erratic distribution in the active form. In the stem and root of the tea plant, the function of the enzyme is probably different from that in the leaf; or it may be that more than one enzyme exists in the different parts of the plant. Certain it is that the reserve bodies in the different parts are quite unlike one another, and would require different classes of enzymes to render them soluble.

We have determined the general occurrence of the enzyme in teas of all classes from all elevations, and it is important to realise that it is apparently as abundant in low-country teas possessing more flavour as in the highest grown teas in Ceylon. It can also be stated that there is very little difference in the amount present in leaf a few weeks from proning, and in leaf two or more years from pruning.

It occurs also in the leaf at all times of the day and night, and no great quantitative differences were noticed in leaves plucked at 6 a.m. and 10 p.m. Leaves plucked under conditions varying from severe drought to heavy rains showed abundance of the enzyme at all times.

STRUCTURE OF A LEAF.

Since in the manufacture of tea we are concerned almost totally with the parts of the leaf, a brief description of them will be here convenient. An ordinary flat tea leaf is in reality composed of an accumulation of microscopic pellets, of a substance called protoplasm. Each of these pellets, or cells, has some duties to perform in the life of the plant, and here and there a definite grouping of cells of a particular shape and size is seen. The layer of relatively small cells which forms an entire covering to the leaf is termed the *epidermis*; the layer of long brick-shaped cells disposed in rows only along the upper surface of the leaf constitutes what is known as the *palisade* tissue, whilst the more or less spherical cells composing the lower and middle part of the leaf is known as the *mesophyll*. In the mesophyll are several small bands of conducting cells known as the *vascular bundles* or *nerves*.

THE GUM GUIACUM REACTION.

When a section of a fresth tea leaf is treated with gum guiacum a blue colour appears mainly in the cells of the epidermis and mesophyll. In many cases the epidermis stains before any of the other parts, and finally assumes the deepest tint. Sometimes the parts around the small vascular bundles in the mesophyll take a deep stain. In every case, yet examined, the contents of the palisade cells have refused to take the blue reaction. This is a very important point to notice, as it would appear that this portion of the leaf, which is known to play the principal part in the manufacture of food materials, is characterised with a minimum quantity, if any of the active enzyme.

There seems some hope of yet being able to associate the maximum occurrence of the active enzyme with a definite granular texture of the contents of the cells, but the significance of this will be discussed at length in a later paper.

It is worth noting that many of the sections do not give the blue reaction until repeated treatment with gum guiacum and exposure to air, or only after adding another oxidising reagent. This is probably due to the enzyme existing in the zymogen or inactive state.

The gum guiacum must thoroughly mix with the cell contents before the blue reaction occurs, and only very thin sections will to a certainty give successful results. When very thin sections are used, the blue compound is seen to pass away from the section, and in consequence of the transient nature of the reaction, is likely to be overlooked.

We have now seen that an enzyme can be generally demonstrated in all tea leaves, and have briefly indicated the manipulation necessary. It will now be convenient to discuss the relation between

ENZYMES AND FLAVOUR.

In one or two instances the action of an enzyme has been utilised commercially to induce chemical changes, which result in the production of a more or less distinctive flavour. As an instance we may take yeast, a common plant, from which no less than five enzymes have been extracted. It has been found that different yeast cells impart to a fluid a different odour and flavour, and this has been used on the continent in the improvement of certain wines. It was shown, that if different portions of the same grape juice were fermented with different species of yeast, wines were obtained which differed much in flavour, because each species of yeast has the power of producing, during fermentation, certain characteristic flavouring bodies. As has been previously pointed out, however, we must remember that all such fermentations require a great deal of time for completion and they are therefore not strictly comparable with the changes occurring in the manufacture of tea. It would be unwise to jump to the conclusion that the enzyme in tea is responsible for what we at the present time know as flavour, although it is possible, that under certain conditions the enzyme will be found to materially affect the quality, and perhaps to some extent the flavour.

It is as well to realise that enzymes of some class or other probably exist in every plant, and their presence is often in no relation to the production of flavouring substances. Even if a flavouring substance is produced by the action of an enzyme on some store material, it is often a question as to whethor the change is desirable. These remarks are made on account of the fact that many planters seem to believe, that if an enzyme is found it is always an advantage, and the products of its activity can be utilised in manufacture.

Our experience would point to the conclusion that maturity of the leaf, utilised in manufacture, was an essential factor for the production of a flavoury tea, Every planter knows, that as soon as the absolute rate of growth is diminished an improvement in quality results, even in the low country. This is also borne out in a general sense in the marked differences in the quality and flavour of the tea grown at high and low elevations, the colder climate of the former determining a slower and more stable growth. In India we have also the finest flavoured teas growing at high elevations, where the climate is cold and vegetation grows comparatively slowly. Again, we might note that what is known as an autumn flavour is produced in Assam teas as soon as the weather gets cold and the bushes more mature from pruning. In comparing young leaves from a bush four weeks from pruning with young leaves from a bush two years, three months after pruning, many differences of structure are to be noticed. In the leaves from the latter, the walls of the cells are thicker, they possess a more definite outline, and the chlorophyll is more definitely granular. Everything

*The soluble ferments and fermentation by J. Reynolds Green.

points to a better organization in the more slowly grown leaf, and it seems probable that this will explain the improved flavour of such leaf.

(To be concluded.)

COFFEE AND THE WORLD'S PRODUCTION.

In the latest Consular Report on Rio de Janeiro, it is stated that the calamitous condition into which the coffee industry has drifted is clearly attributable to the unnecessarily large production, a sequel of the very extensive planting which took place six years ago, when prices were high and credits for enterprize of all kinds extremely facile. The world's consumption is now calculated at 14,500,000 bags per annum, and it was the custom to say that, to make up this quantity, 10,000,000 bags were required from Brazil. More recent calculations, however, favour the idea that no more than 8,500,000 to 9,000,000 bags are wanted from that country. But, however that may be, seeing that the world's production is 16,500,000 bags annually, and that the aggregate production of other countries has not expanded during the last 26 years, the excess in production in relation to consumption of 2,000,000 bags annually is attributed entirely to Brazil.

The realisation of this fact led to a project, strongly advocated at first in many quarters, aiming at the compulsory destruction of 20 per cent of the early crops. Fortunately, this anti-economic idea has now been generally condemned and more salutary methods of improving the situation are being earnestly ventilated. The cost of production, of course, varies according to the circumstances of each plantation, its situation, nature of soil, extension, yield per tree, etc. Working expenses in Sao paulo, for example, are considered to be, as a rule, 15 per cent. less than in Rio de Janeiro and Minas Geraes. Perhaps the average figure, including sacking and transit to shipping port, would be about 7 milreis per 32 lb. As the export value for the standard grade 7 is no more than this, and as the planter has still to pay the export duty of 9 to 11 per cent. *ad valorem*, it is evident that a considerable reduction in cost of production must be brought about if coffee cultivation is to continue as a paying industry. To this end incessant claims have been made for reduction of export dues and transport tariffs, and they have not been left entirely unattended to.

The State of Minas Geraes, for example, has reduced its export tax from 11 to 9 per cent. *ad valorem*, and the freight tariffs on the Central, Leopoldina, and other railways have been reduced 25 per cent. for hulled, and 30 per cent, for unhulled coffee, while a maximum rate of 100 milreis per ton is to be charged irrespective of distance. Field machinery and implements and all agricultural accessories also are now exempted from import duties, while favours have been extended to mortgagees to free them from foreclosure during the continuance of the crisis. Moreover, a more encouraging field for consumption in France has been opened by the reduction of the import duties into that country from 156 to 136 fr. per 100 kilos. All these measures will, however, be ineffectual in warding off collapse in many cases, for the simple reason that many of the new estates have been acquired and developed by means of mortgage loans by persons who have not even the floating capital necessary for current working expenses and who, during this period of restricted credit, will be quite unable to obtain the assistance necessary for this branch of expenditure.—*Home paper*

CULTIVATION OF ORANGES.

By F. E. H. W. KRICHAUFF, Chairman Central Agricultural Bureau, S.A.

Although the whole of the citrus tribe prefer a sweet friable soil of good depth and moisture, without being too wet, or planted in holes that prove to be stagnant puddles unable to drain themselves, the soil is of less importance than irrigation or manuring; only an excess of moisture causes too often disease of the roots but moderate irrigation, and manuring liberally and regularly, will induce orange trees to become profitable.

Senor Alino, F.R.H.S., of Valencia, Spain, says an acre planted with orange trees may produce 26,500 lb. of fruit, and such a crop probably contains 100 lb. of nitrogen, the same of potash, 105 lb, of phosphoric acid, and 220 lb. of lime, not counting wood and leaves. It is therefore absolutely necessary to give compensatory fertilisers, although somewhat modified in accordance with the soil and its constituents. A clay soil, although poor in phosphoric acid, most likely does not require the whole of the potash returned for some years, as might be necessary for a soil rich in lime and phospholric acid. Gypsum reduces a soil rich in potash to a fit state for its absorption, and a smaller quantity of this fertiliser may therefore become necessary. Sandy soils are generally poor in plant food, and require all of them—after such a crop, at all events. Senor Alino, however, says that an excess of phosphoric acid results in many but small fruits, well flavoured, with a thin skin; and trees that are shy bearers may therefore require more of a phosphatic manure. Potash makes the fruit even more sweet and juicy, while too much nitrogen produces much wood and foliage, but coarse, thick-skinned, late ripening fruits, containing little sugar or aroma, and they do not keep well.

It is admitted that dung and other organic manures are useful as an aid to commercial fertilisers, which, however, are so much quicker consumed, but it is not advisable to give horse-dung more frequently than once in three years. Orange trees are never quite without a movemet of sap at any time of the year, and apparently require plant food to be given more than once a year, especially nitrogen, although once is sufficient for most other fruit trees.

Senor Alino wants a deep annual ploughing, which it seems to me must injure the large number of fibrous roots which, here at least, are generally found to be near the surface. When manuring, a slight stirring of the surface by a four-pronged fork seems to me far better, and does not necessitate trimmed up trees to enable ploughs to run near the stems. Low branches are good protection of the trunk against our frequently too powerful sun. He forms round holes around his trees, and says that neither water nor manure should be allowed to enter. This certainly is a statement which has surprised me and probably most of our orange growers, as our circle formed around a tree was expressly made to water it better. He warns orchardists also to spread fertilisers not within a hand-breadth around the trunks.

Young trees require per acre 325 lb. of nitrate of soda (or an equivalent of 260 lb. of sulphate of ammonia), 264 lb. of a phosphatic manure and 60 lb. of sulphate of potash in preference to muriate of potash. For old trees in full bearing, 350 lb. of sulphate of ammonia, or 440 lb. of nitrate of soda, 600 lb. of superphosphate of lime and 80 lb. of sulphate of potash may be required, If nitrate of soda is to be used, Thomas phosphate should be applied as phosphatic fertiliser. Lime, although it may be required, should not be given with the above fertiliser; either some time before or later. It is, however, well to apply perhaps both forms of nitrogen—namely, one-half of the doses of sulphate of ammonia in our winter, and one-half of the nitrate of soda three months later, when such division of the nitrogen may prevent the dropping of the young fruit. If the trees are not vigorous give but little potash; if too luxuriant, with few fruits, omit the nitrogen and give more superphosphate. In the United States a fertiliser is used consisting of four cent. ammonia, five to six per cent. phosphoric acid, and thirteen per cent. potash, spread and broadcast twice a year, with great results. *Journal of the Department of Agriculture, Western Australia.*

CAMPHOR.

The recent establishment by the Government of Japan of a monopoly of the production and sale of camphor in Formosa has attracted much attention to this product, and at the same time, by raising the market price, has rendered it by no means unlikely that this may prove to be a profitable cultivation in Ceylon. The present Circular is issued to lay before the planting public, the chief facts connected with this industry, and to describe the methods of cultivation and preparation which have been found best suited to Ceylon in the experiments so far tried with this tree.

The total export of camphor to Europe and America is perhaps about 60,000 piculs annually, or 8,000,000 lb. The market value of crude camphor in Europe is at present about 155 shillings per cwt., or about 1s. 4½d. per lb. Camphor was formerly used chiefly as a drug and for the prevention of insect ravages in clothing, &c., but of late years, in addition to these uses, it has been largely employed in the manufacture of smokeless powders and of celluloid. The tree also produces an oil,—camphor oil,—obtained with the camphor in the preparation of the latter, and which is used in the manufacture of soaps and for other purposes.

BOTANY.

Common, Formosa, Chinese, or Japanese camphor is the product of *Cinnamomum Camphora*, Nees, a tree occurring native along the eastern side of Asia from Cochin-China to Shanghai, and in the islands from Hainan to South Japan; its limits of latitudinal range are from 10° to 34° N., but it is cultivated in Japan to 36° N. In the southern parts of its range it occurs chiefly in the hills.

Two other forms of camphor are frequently met with, though rarely exported to Europe. Barus, Bhimsaini, Borneo, or Malay camphor is the product of *Dryobalanops Camphora*, Colebr., a large tree of the family Dipterocarpaceæ, occurring in the islands of Sumatra, Borneo, &c. This camphor is slightly heavier than common camphor, and is highly prized by the natives of India and China, who purchase the entire very small produce at fancy prices, from 100 to 200 shillings per pound. A third form, Ngai, or Blumea camphor, is prepared in S.E. China from *Blumea balsamifera*, one of the family Compositæ In Ceylon the natives prepare a small quantity of camphor from the roots of cinnamon, *Cinnamomum zeylanicum*, a plant nearly related to the true camphor. In the remainder of this paper only the common camphor, *Cinnamomum Camphora*, will be dealt with.

In its native country the plant grows into a tree about 100 feet high with a trunk 2 to 3 feet in diameter. It is evergreen, with moderate sized laurel-like leaves, which when crushed smell strongly of camphor. It may be well to mention in this connection that the tree is very handsome when young and forms one of the best ornamental trees for roadsides, parks, compounds, &c., in Ceylon.

The native habitat of the species is not widely extended, but it has been successfully cultivated in Ceylon, India, Australia, Florida, California, and elsewhere. It was introduced into Ceylon by the Royal Botanic Gardens in 1852. In 1895 plants were largely distributed from Hakgala to many planters and others. These were the result of seeds obtained in the autumn of 1893 from Japan. Mr. Nock, Superintendent of Hakgala, has collected information about these trees, some 950 in all, and reports as follows:—

"During 1895 plants of camphor were distributed from Hakgala to planters in various parts of the Island at elevations ranging from 250 to 6,450 feet, with annual rainfalls varying from 54 inches on 104 days to 217 inches on 212 days. Replies as to the growth of the plants have been received from thirty localities, and I think it is pretty well proved that under certain conditions of soil and climate camphor will thrive at all elevations in Ceylon from about sea level to the highest mountains.

"It appears to thrive best in a well-drained deep sandy loam in sheltered situations with a rainfall of 90 inches and over, and dislikes poor or close, stiff, undrained soil. The growth is slow in sterile soil, but, under favourable conditions, in good soil is very rapid, the tree reaching a height of 18 to 20 feet in five years, with a spread of branches of 8 to 12 feet and a stem of 6 to 7 inches in diameter. This compares very favourably with the growth of the trees in their native habitat, where a tree 30 feet high and 6 inches in diameter, a ten years old is considered good. The best five-year old tree (from planting) in Ceylon is at Veyangoda, at an elevation of about 100 feet with a rainfall of about 100 inches on 180 days. It is 25 feet high and growing luxuriantly. The next best are at Hakgala, where the largest is 20 feet high, with a spread of 13 feet, and a stemdiameter of 7½ inches at the ground.

"The habit of the trees in Ceylon in good soil is bushy, with a tendency to throw up many stems. This is a point of importance, as it shows that the tree will coppice well and stand frequent cuttings or prunings, and possibly even plucking of the flush as with tea. In close, hard, undrained or stiff clayey soil the growth is poor, and the habit stunted or dwarfed, and this is also the case in exposed wind-blown situations.

"Of course it is only in the experimental stage here yet, but judging from my experience of it for some years, it is my opinion that as a minor product it should be grown in the form of hedges, planted at distances of 6 to 9 feet apart and 2 to 3 feet apart in the row. The rows should run N.W. and S.E., or across the directions of the prevailing winds, and the plants be allowed to grow 6 to 9 feet high. Planted in this way there would be ample room for cultivation, and each row would shelter the other from the N.E. and S.W. winds, besides forming a large surface for clipping. As the young shoots appear to yield the most camphor, the crop could be obtained by clipping the hedge with a pair of light shears, and the expense would be very slight. The trees might also be planted at 6 feet apart, and treated in the same way as tea bushes, or they might be planted 12 feet apart, and trained as pyramids, or again planted 4 feet apart and alternate plants coppiced in alternate years.")

PROPAGATION, CULTIVATION, &C,

Mr. Nock states:—

"Camphor plants are best and easily propagated from seeds. The seeds do not keep well, and should be sown as soon as possible after ripening. They ripen in Japan, which at present is the only important source of seed, in October and November, and should be ordered some time in advance, so as to obtain them as soon as they are ripe. I find it a good plan to soak the seed in water for twenty-four to forty-eight hours before sowing, agitating the water occasionally. The best seeds, being heavier, will sink to the bottom, and these should be sown thinly by themselves; the lighter ones should be sown thickly, as only a small percentage will germinate.

"The seeds should be sown in well-prepared beds of sandy loam and leaf mould; they should be sown from ½ to ¾ inch deep, making the bed firm, but not tight. The beds should be kept shaded and just moist Too much wet will cause the young seedlings to damp off, and if allowed to get too dry the germs will quickly dry up and die.

"We have been most successful when the seed has been sown in boxes (made of ½ inch wood) 18 by 13 by 3½ inches, filled with the kind of soil described above. The boxes are handy to lift about, and can be easily protected from heavy rain and strong sun. Sheds

made after the style of the old cinchona seed sheds answer well for standing the boxes in, and if made light and airy would do well to sow the seeds in direct, but care should be taken not to allow the young plants to be 'drawn.'

"We find it a good plan to prick out the seedling into supply baskets as soon as they are large enough to handle comfortably, or transplant them into beds, placing the plants 6 inches apart every way, and keeping them shaded and watered until they begin to grow, when they will bear the full light of the sun, but will require to be freely watered in dry weather.

"When the plants are from 9 to 15 inches high they are at their best for final planting, but if the weather is unsuitable they may be kept in the nursery till they are 2 feet high, or until good planting weather occurs, viz., dull showery weather. In such weather they require very little shading, and soon take hold of the soil.

"Cuttings do not strike root readily, and only under certain conditions will they be successful. If the prevailing weather should be too dry they soon go off, and if too wet and cold they decay before roots are formed. We have had batches of cuttings with 70 per cent. beginning to call us over, and young shoots forming, that have gone off after three or four days of rough weather—cold high winds and heavy rains—and others that have gone the same way after a week of dry sunny weather. The favourable conditions are equable heat, light, and moisture; with these, and wood for cuttings in a proper state, a large percentage will strike root and make good plants.

"The nursery beds for seeds as well as cuttings should be made in a well-drained situation, and as near water as possible. The beds may be any length, and from 3 to 4 feet wide. The soil for cuttings should be composed as follows: one part good sandy loam, one part leaf mould, and one part clean sharp sand (to this it would be beneficial to add a good sprinkling of powdered charcoal), all thoroughly mixed. The soil should be 6 to 9 inches deep. A layer of good sharp sand one inch thick should be laid on the surface. As a protection against hot sun and heavy rains it would be well to put a roof of thatch over the beds in the form of a shed, but it should be constructed with open sides to allow plenty of light and air. A shed 4 feet wide, with a lean-to roof on stout posts, open at the back and front, will be found a useful size. The posts should be 6 feet high in front and 3 ft. 6 in. at the back. The roof may be thatch, shingles, or other light material. If more than one is required, a space 4 feet wide should be left between the sheds to give room for watering, weeding, and general attention.

"The best material for cuttings is that from straight, healthy, and well-matured shoots of the current year's growth, not too soft or too hard. If too hard they will not root readily, and if too soft they will be liable to damp off. The cuttings may be of any size from the thickness of a lead pencil to ¾ inch in diameter. They should be cut into lengths of from 6 to 9 inches. A clean cut with a very sharp knife immediately below a joint to form the base of the cutting is of the greatest importance. If the cut portion is torn or jagged, or too far away from the joint, it is almost certain to decay, though it may remain green for a long time.

"The operation for inserting the cuttings is best done by opening a trench with a sharp spade so as to form a straight edge. The prepared cuttings should be laid against this and the soil pressed firmly round them. They should be placed in rows 9 to 12 inches apart, and 3 inches apart in the rows, and at a sufficient depth to leave only two or three buds above the surface.

"The sooner the cuttings are made and put in after being taken from the trees the better. After the cuttings are put in the beds should be watered to settle the soil, and if in the open they must be carefully shaded and sunlight must be only gradually let in as they become rooted and can bear it. If all goes well they should be rooted in 2 to 3 months, but they will not be ready for planting out for three or four months.

"Camphor may also be propagated by layers. The operation of layering is very simple. The shoots should be sent down to the soil. The branch at the bend should be cut halfway through, then cutting upwards for about 1½ to 2 inches, so as to form a tongue. The cut portion must be kept apart by a slight twist, or by placing a piece of brick or a small stone in the cleft. The shoot should then be pegged down firmly into a groove made in the soil for its reception and covered with soil. The end of the shoot must be kept upright by tying it to a stick.

"Another simple way is to split the branch at the bend where it is to be laid in the ground, making the split about 2 inches long, and keeping the cut parts open by inserting a piece of wood or stone. Peg down well into the soil and stake. The ends of the shoots should be cut back a few inches with a sharp knife."

It is thus evident that the plant will thrive almost anywhere in the Island if the water supply be sufficient and the soil well drained. The best method of treatment is probably to grow it as hedges, which are easily managed and clipped. It may also be planted along roads, jungle edges, &c., but *should never be mixed with the tea*, as the young leaves are very like those of tea, and a twig or two of camphor will spoil a whole break of tea.

The following analyses of two soils at Hakgala—on one of which (A) camphor does very well, on the other (B) only moderately—will help to guide to the selection of suitable spots:—

CAMPHOR SOILS.

"Six samples of soil were received from Mr. Nock at Hakgala, which represented the character of the soil and sub-soil, where camphor trees grew well and only fairly well.

"*No. 1 A* represents a section 15 inches deep between trees showing the best growth, viz., 20 to 25 feet high and 12 to 15 feet in diameter at five years and nine months from the time of planting. The surface soil here is about 1 foot deep. It is composed of agglomerated particles of dark brown colour and yellow fragments of decomposing gneiss. It is very rich in nitrogen and the lower oxide of iron, has a fair amount of lime, but is deficient in potash and phosphoric acid.

"*No. 2 A*, representing the upper 6 inches, is of a dark brownish colour when dry, and is almost entirely composed of the agglomerated particles mentioned in No. 1 A and rootlets, &c. The analysis shows it to contain the bulk of the nitrogen, and an excess of the lower oxide of iron, but it is deficient in potash and phosphoric acid.

No. 3 A represents the sub-soil at 15 inches deep or 3 inches below the actual surface soil. It is composed of yellow pieces of decomposing light-coloured gneiss, more or less bound together with a clayey matrix. It also contains a fair amount of nitrogen and rather more phosphoric acid and potash than the surface soil, and would be fairly easily penetrated by roots.

"*No. 1 B*.—This is taken from a section 15 inches deep, where the camphor is only doing fairly well. The plants five years and nine months old are from 9 to 10 ft. high and 6 to 8 ft. in diameter. It is more finely divided than No. 1 A, and is of a lighter-brown colour. Chemically, it is also somewhat poorer, though containing a good amount of nitrogen. Lime and mineral plant food generally may be considered deficient, especially potash, and this no doubt accounts for the poorer growth of the camphor trees in this part.

"*No. 2 B*, representing the top 6 inches, is a dark coloured loam, somewhat richer in nitrogen and phosphoric acid than No. 1 B, but is very poor in lime, magnesia, and potash.

"*No. 3 B*, representing the sub oil 15 inches from the surface, is a yellow loam much more finely divided than No. 3 A, but otherwise of somewhat similar composition. When wet it is of a retentive clayey nature requiring drainage.

HAKGALA, NUWARA ELIYA.

ANALYSIS OF SOIL (CAMPHOR).

Mechanical Composition.

	No. 1 A.	No. 2 A.	No. 3 A.
	Per cent.	Per cent.	Per cent
Fine soil passing 90 mesh	20·00	26·00	34·00
Fine soil passing 60 mesh	15·00	24·00	18·50
Medium passing 30 mesh	7·00	5·00	7·50
Coarse sand and small stones	58·00	45·00	40·00
	100·00	100·00	100·00

Chemical Composition.

	No 1 A.	No. 2 A.	No. 3 A.
	Per cent.	Per cent.	Per cent.
Moisture	5·100	5·000	5·900
Organic matter and combined water	14·500	17·700	11·500
Oxide of iron and manganese	8·200	7·080	9·800
Oxide of iron and aluminium	11·346	7·575	10·000
Lime	·140	·124	·050
Magnesia	·072	·075	·020
Potash	·030	·011	·061
Phosphoric acid	·012	·035	·069
Sand and silicates	60·600	62·400	63·000
	100·000	100·000	100·000
Containing nitrogen	·308	·490	·182
Equal to ammonia	·374	·595	·221
Lower oxide of iron	Good	Much	Fair

Mechinical Composition.

	No. 1 B.	No. 2 B.	No. 3 B.
	Per cent.	Per cent.	Per cent.
Fine soil passing 90 mesh	25·00	17·50	47·50
Fine soil passing 60 mesh	23·00	16·50	26·50
Medium soil passing 30 mesh	8·50	6·50	5·00
Coarse sand and small Stones	43·50	59·50	21·50
	100·00	100·00	100·00

Chemical Composition.

Moisture	5·100	5·100	5·800
Organic matter and combined water	11 900	15·500	11·400
Oxide of iron and manganese	8·000	8.200	8·520
Oxide of iron and aluminium	9·210	8·050	12·502
Lime	·080	·060	·010
Magnesia	·070	·014	046
Potash	·015	·007	·054
Phosphoric acid	·025	·069	·038
Sand and silicates	65·600	63·000	61·600
	100·000	100·000	100·000
Containing nitrogen	·259	·371	·128
Equal to ammonia	·314	·450	·156
Lower oxide of iron	Fair	Much	Trace

*Containing nitrogen 1·47 per cent.
Equal to ammonia 1·78 „

"The ash of the camphor leaves was analyzed to determine the constituents most required by their growth. The leaves contained—

	Per cent.
Water	74·32
Organic matter*	19 58
Ash	6·10
	100 00

Composition of Ash	Per cent.
Lime	32·90
Magnesia	6·48
Oxide of iron	2·00
Alumina	3·11
Potash	14·86
Soda	4·21
Phosphoric acid	2·16
Sulphuric acid	2·00
Sand and silica	1·20
Carbonic acid	26·10
Carbon and undetermined	4·98
	100·00

"The chief mineral ingredients required by the camphor plant for the growth of leaves are lime and potash, an average yield of prunings removing 196 lb. of lime and 87 lb. of potash, which could be returned to the soil after the distilled wood had been burned for fuel purposes.

"M. KELWAY BAMBER, F.C.S., &c.,

BANANAS UNDER IRRIGATION.

(*Continued from page 510.*)

VIRGIN LAND.—In virgin land, cultivation is hardly necessary. The great quantity of humus in the soil furnishes a readily available source of plant food, and, with the stumps rotting in the ground, assists drainage and aeration by keeping the soil free and open. It is when the supply of humus is becoming exhausted that the necessity for cultivation arises. The decay of the roots of the weeds cut down by the hoe also assists in keeping the soil in good condition. I am afraid too much is left to nature in this respect. Natural conditions in the tropics are so favourable to agriculture that at times the soil produces good crops in spite of what is done to it.

USE OF CULTIVATORS.—We have seen that the roots of the bananas are fleshy, and that they require a free soil for their proper development. Then, as the soil is exhausted more and more, to absorb the same amount of nourishment the root system has to become more extended. Hence let us consider how the soil and roots should be treated.

PLOUGHING.—My experience has led me to the conclusion that in soil varying from light sandy loam to heavy loam, one thorough ploughing and cross-ploughing per year is sufficient. Just how deep the plough should go depends on the condition of the soil. From four to eight inches should be sufficient. This will cut the root and induce branching from the cut ends, set free a supply of food for the use of the plants, and put the soil in a proper condition for the use of the cultivator. The more thoroughly the soil is broken the more will the elements act on it. Large clods are unfit for plant life; and when the surface is left in this condition soft roots are very liable to dry up. Hence the plough should be followed by the harrow before the lumps of earth bake.

SUBSOIL PLOUGH.—In addition to the yearly ploughing, it will often be found advisable to use a subsoil plough. From the pressing down of the lower stratum of the soil by the turning plough, the passage of air into it is more or less stopped, and water is apt to stagnate. While it may allow of the passage o

roots, it may still be too compact for their proper growth, and for the admission of air, and the roots will remain near the surface, an easy prey to dry weather, Every three or fonr years should he often enough for the use of the snb-soil plough, except in spots where water settles frequently. The time at which hananas are ploughed is a very important point. I have found it a very good plan to fork young hananas when ahout two months old, so as to break the hard earth immediately ontside the hole; which could hardly be done thoroughly with the plongh. Of course, it is hetter to thoroughly prepare the land with the plough hefore planting; hut where this cannot he done, forking the plants at this stage will be found to give them a good start. This also helps to economise water.

FRUITING OF PLANTS.—The ohject of every plant is to prodnce fruit and seed, and so perpetuate itself; and any disturbance of its growth while preparing for this, the object of its life, will seriously impair its condition, and reduce the qnality, and qnantity or size of its fruit. It is therefore highly necessary that the root system should suffer no shock; but should be so treated as to be strengthened. No plant can successfully make both roots and fruit, nor can it produce good frnit without sufficient roots. Hence we see the importance of ploughing hananas before they hegin to make the hunches. Just how late we can do this is hard to say, as there is little precise information to got on the subject. Under present conditions, where the bnlk of the fruit is wanted from March to Jnne, I would not consider it desirable to plough hananas after Novemher at latest. As soon as the hulk of the crop is cut, the plongh should he started, and all plonghing should be finished before December.

CULTIVATORS.—It is a good plan when ploughing to throw the soil into the centre of the rows, and so prodnce a convex surface. When the soil is thrown towards the plants, and the rows become hollowed, it is very hard to irrigate thoroughly. If the trench is put at the side of the row, the water is very apt to hreak away and cause ponding; or if in the middle, the water will wet only a small portion of the land. When the row is "round-ridged," so to speak, and the trench cnt in the centre, the water is easy to control, and more thorough work can he done. It also induce the roots to travel towards the water, so increasing the feeding area,—a most important point in dealing with land which has heen in cultivation for some time. Plonghing finished and the harrow having heen freely used, the planter has then to devote his attention to a most important point, namely, how to make the most of his water supply. Constant surface cultivation is perhaps the best remedy for drought we have. It gives a mnlch which does not require to be drawn off and on, drives the feeders down out of the wilting influence of wind and sun, prevents loss of moisture by evaporation—in short it keeps the plants growing. Should heavy rains fall, heating the surface down, cansing it to hake into a crust, it will he found quite safe to plough lightly if surface cultivation has been diligently employed. The surface should never be allowed to hake. Various implements are in use for stirring the snrface, from the scuffle hoe, worked by hand, to the riding cultivator drawn by a pair of hig mules. In practice, I have found the disc harrow the most useful implement, it giving a mulch of thoroughly pnlverized soil about fonr inches deep. The spading harrow will even break np a orust perfectly impervious to any toothed implement—thus obviating the necessity for nsing the plough. It also chops up weeds, covering them lightly. The best time to use the disc harrow is *always* when the soil is not too wet.

PRUNING.—This is a question on which opinion is very much divided. The term "pruning" as applied to bananas is sometimes taken exception to, for which reason it is hard to say. Prnning is a removal of useless and dead growth, to throw all the strength into the reproductive part of the plant; and this is precisely what is done with the banana.

TIME OF PRUNING.—The time of prnning should he regnlated by the need of it. Slow growing plants require pruning as a rule once a year, and that at a well defined time—usually when the tree is at rest. It may he taken as an axiom that the quicker the growth of a plant, the more constant care it requires; as any influence for good or evil will he felt quickly—this applying to all the operations of the farmer. Hence it would follow that pruning hananas should be done whenever necessary, at any time of the year.

OBJECTIONS.—It is sometimes urged that prnning at any other time than in the winter months is highly injurious to bananas, owing to the excessive bleeding of the trees. This is true to a certain extent, as all vegetation naturally has a most vigorous growth in the spring. But is this bleeding out of proportion to the amount of sap in the tree; and is it more injurious than the demands of a crowd of suckers on the available plant food? When it is remembered that every young sucker occupies a certain space on the bulb that might otherwise be occupied by the roots of the parent tree; and that every young sucker, be it only an inch above ground, has roots of its own, it will be seen that every sucker other than those intended to hear fruit is a distinct check to the growth of the parent tree and its destined successor. It is barely necessary to define the condition of a field when prnning should he done. It will be of more service to examine the effects of want of prnning. Cutting off the trash and leaves hanging down is the first operation. The trash seems designed to protect the tree from the direct rays of the sun; hut in a plantation, where a great deal of light is filtered through the tops of the trees, it is not often required for this purpose—except in the outside rows, and where, from wind or other cause, the snn can enter too freely. Too much sun canses the outer sheath of the tree to dry np. Too much trash hinders the circulation of air, causes the young suckers to run np into spindly whips, and contributes to a weakness of the stems of the trees which is only too apparent in a heavy wind. This latter point will be referred to again.

CUTTING TRASH.—Another point in connection with the trash is that in plant bananas it often rests on the ground at the base of the tree, cansing the roots to come to the snrface. This is, of conrse, to be avoided.

SELECTION OF SUCKERS.—It is important that the best suckers only be left. Those which are deep rooted are the best, as they have a hetter grip of the gronnd and are less liable to hlow down when well grown. Due regard to position must also he had, one sucker to each tree, so as to have as mnch space as possible hetween them.

CUT SUCKERS.—Objection is sometimes taken to cut suckers heing left—that is, suckers which have heen cut while the previous pruning was heing done; on the ground that the hnnches from these suckers will he inferior. My experience has not shewn this to be a fact, unless the sucker was cnt when well developed. I measured a cut sncker, and found it was 22 inches high, and eight inches across at the level. This would seem to indicate that cutting a sncker while young tends to inorease the size of the bulk.

METHODS OF CUTTING OUT SUCKERS.—The cutlass should not be pointed towards the tree, bnt sideways so as not to stab the parent tree. The sucker should be cut down to the hard, white part; as if imperfectly cut, it will spring np again very quickly.

GREEN LEAVES.—Green leaves should not be cnt off to allow the tree to withdraw the sap from them.

OLD STUMPS.—The tree is usually cut over ahout six feet from the ground, the bnnch cut off, and the upper part of the tree severed completely, leaving an "arm." I am of the opinion that the whole of this should he left until it can he pulled away from the bulk; as observation has shewn that the following sucker thrives better.

Number of Suckers.—The question of how many trees we can allow to the root depends in the first place on the distance apart at which the field was planted. I have seen the following distances tried; 15 x 15, 14 x 14, 12 x 12, 8 x 8, 7' 6" x 7' 6," 15 x 7' 6," 10 x 6, and 12 x 8.

Close Planting.—"Close Planting" (8 x 8 and 7' 6') was the result of the demand for fruit being confined to five months in the spring. This method has given good results under proper management. Pruning should be strictly carried out. Attempts have been made, where the crop was coming in too soon, to retard it by leaving young suckers round the single trees. This can only result in stunting of the bunches. In good land, the best plan for ratooning is to take out every row, leaving the field 16 x 8; permitting two or three suckers to grow in each root. It may be necessary for the third ratoons to bring the field to 16 x 16. Ratooning 8 x 8 in rich land can hardly be recommended. In hot land, 8 x 8 gives very good results, covering the ground quickly; and can be ratooned with success. 7" -6" x 7' -6" I consider too close.

Close by Wide.—This method, (e. g. 15 x 7' -6,") brings in the crop very evenly, but can hardly be recommended for ratooning. Plants may have two suckers in each root; but the ratoons are apt to be crowded. In planting close by wide, it is a good plan to plant the wide rows north and south, so as to allow as much sun as possible to penetrate.

Wide Planting.—This is the old method, and one that has proved successful. It is not possible to regulate the crop so well; but where fruit can be sold all the year round this is hardly a disadvantage. Cultivation with implements can be better carried on, 15 x 15 is the usual distance. Three or four suckers to each root may be left, according to the richness of the soil. The advantages and disadvantages of the different methods of planting may be summarised as follows:

Close Planting.—Evenness of crop. Less weeding. Less water. Quick returns.	Extra cost of planting. Extra pruning. Trouble in reducing to wide or close by wide.
Close by Wide.—Evenness of crop. Quicker growth. Economy of water. Less weeding.	Can only be cultivated one way. Extra pruning. Crowding of ratoons. Trouble of reducing to wide. Extra cost of planting.
Wide Planting.—Can be cultivated both ways. Less pruning. No trouble in reducing.	Crop more spread. Slower returns. Extra weeding.

General.—The time in which suckers fruit varies considerably. Plants take from 10 to 16 months, (the latter being the second suckers,) Ratoons take from 14 to 18 months. The causes governing these are the nature of the soils, weather conditions, distance of planting, mode of cultivation. It is impossible to lay down any hard and fast rule on the subject. The penalties for leaving too many suckers are two—small bunches, and blow downs. In one piece of bananas which had in my opinion too many suckers and too much trash, a heavy wind played havoc. It was very noticeable that three out of four suckers were broken over, not uprooted. The land was rich; and the suckers would in the circumstances throw out many roots. They were, too, first ratoons, which are usually strong rooted. In adjacent fields, properly pruned, the loss was comparatively trifling; and, most of the trees were uprooted. It is advisable when pruning to clean the root out thoroughly removing all trash, etc.

"H. J. Charles."

Journal of the Jamaica Agricultural Society.

THE IDENTIFICATION OF WOOD.

I have read with much interest Mr. Herbert Stone's paper on the above subject, and would like to be permitted to make a few remarks as an addition to a discussion at which I was unable to be present.

First of all, a small personal matter. My "Manual of Indian Timbers" was several times referred to in very kind language, but both in Mr. Stone's paper, and in the remarks upon it by Dr. Schlich, there is some misapprehension regarding the responsibility of the descriptions of woods given in it. I feel sure that Dr. Schlich was not properly reported, and as, possibly, Mr. Stone had not read my introduction, I propose to give the full extract from page ix., written in November, 1881. The "writer" was, of course, myself.

"It is now necessary to explain how the descriptions of the woods were made. During the progress of the work of preparation of specimens in Calcutta, and afterwards at more leisure in Simla, the examination of the different woods and their description was made by a committee which consisted of—

"1. Dr. D. Brandis, F.R.S., C.I.E., Inspector-General of Forests.

"2. Mr. J. S. Gamble, M.A., Assistant to the Inspector-General of Forests.

"3, Mr. A. Smythies, B.A., Assistant Conservator of Forests, Central Provinces.

"The descriptions were usually dictated by Dr. Brandis, and written down by one of the others, generally Mr. Smythies, but the wood structure was examined by all three officers, and discussed before the description was finally passed. The whole was gone over three or four times, and in the later examinations, when the Committee was more accustomed to the differences of structure, the generic and family characters were discussed and drawn up. Some of the later received specimens, as well as those given in Addenda,' were described by the writer, but on the same plan and principal as was originally adopted by the Committee."

In referring to the chief works on the subject of the description of wood, and giving keys to enable them to be identified by their more easily-seen characters, Mr. Stone omitted to mention what is, in all probability, the most important, if not the earliest, book on the subject relating to European woods—the "Flore Forestiere" of Mons. A. Mathieu, late Professor of Forestry at the Forest School at Nancy, France. The first edition of Professor Mathieu's work was published in 1858; it was followed by a second and third, the latter in 1877; the fourth edition, issued since Professor Mathieu's death, with complete revision, by his successor, Professor Fliche, appeared in 1897. In the "Flore Forestiere" the wood descriptions are given with the genera, supplemented, where necessary, for the species; and at the end of the book is a detailed analytical key, which in my opinion, is much better than the keys given by Professor Nordlinger and Professor Hartig. I can also recommend to Mr. Stone the excellent key to English (and some Indian) woods given in "Timber, and some of its Diseases," the very useful little work by Professor Marshall Ward, F.R.S., of Cambridge, published in the "Nature Series."

I cannot agree, and I do not think that Indian botanists of any branch will agree, with Mr. Stone's complaint that "botanical explorers" omit from their descriptions, the useful products of the plants. Of course, in large general floras like the "Flora of British India," it would be impossible to insert such things, but, with such exceptions, nearly every Indian botanist has given, perforce briefly, economic information. Roxburgh's "Flora Indica" is an excellent case in point. If, Mr. Stone will study the "Dictionary of the Economic Products of India," by Dr. G. Watts, C.I.E., probably the most complete work of the kind prepared in any country in the world, he will see what Indian botanical explorers have done for the economic products of the country. In the

"Manual of Indian Timbers," the wood specimens collected by Dr. Wallich were all examined and mentioned, as were the more recent collections of Sir D. Brandis, Mr. S. Kurz, Col. Ford. and others. In my new edition about to be issued I have included also the collections of Sir J. D. Hooker, Mr. H. N. Ridley (Malay) and others, deposited at Kew; and one of my chief regrets is that the collection of the Brothers Schlagintweit could not also be included, because the names have been lost. What has been done in India, of course, I know more intimately, but I also know that Colonial British explorers have not deserved to be accused of neglect, and that the work done by the French and the Dutch has been as good as, indeed if anything, better than our own.

I think that in his remarks about Kew Dr. A. Henry was not quite just. I have been recently working in the Kew Museum and have been struck with the care taken to incorporate in it the woods sent by various correspondents. As I was not specially interested in Chinese woods, I can say nothing about Dr. Henry's collections, but they are doubtless there, ready for him or another to work up. The authorities at Kew were most kind in their help to me and were delighted that I should work in the museum; but it is abundantly clear to anybody who inquires into the matter that the present miserably inadequate and ill-paid Kew staff could not be expected to do wood-descriptions for explorers in addition to their own work. The Kew collections are national, and the herbarium and museum are maintained by the State, not only for study by the staff of the establishment, but to be conveniently at the disposal of workers in general. There are, unfortunately, not many specialists in the study of woods, and it is very good news to those interested in the subject that Mr. Stone is going to devote his scientific life to it. His paper was very interesting, and I, for one, shall eagerly look forward to the results of his further work.

December 9th, 1901. J. S. GAMBLE.

—*Journal of the Society of Arts.*

THE EFFECT OF FORESTS ON THE CIRCULATION OF WATER AT THE SURFACE OF CONTINENT.

(Continued from page 513.)

On level spots in the mountains, whether forest' grass or bare, there is a decidedly greater amount of moisture in the soil than in the plains under similar circumstances. There is more rainfall and the snow lies longer. The amounts evaporated directly, or utilised by plants, are also less. It is well-known that high plateaux, &c., are often swampy or peaty. But level spots are the exception, mountains consisting principally of more or less steep slopes where surface flow is an important factor. In fact, the surface flow is the great characteristic of unlevel countries and constitutes the great difference between these and the plains. There are numerous examples continually coming to light, showing the excellent effect produced by forests on the volume, the regularity, and the maintenance of springs. This is perhaps the place to mention a certain nala in Lachiwala forest, coming down from Nagsidh hill. Up to 1896 this nala carried running water in November-December. In later years it has always been dry by the end of October. The dryness is perhaps not premanent for the future, but it may be due to fellings that have been made on the slopes of Nagsidh. Nobody now denies the beneficent action of forests from a quadruple point of view, *viz.*, the increase of rainfall, the protection of the soil from erosion, the more regular flow and diminution of floods, and the maintenance and steady flow of springs.

How is it possible to explain the apparent contradiction between this last point and the result of the previously mentioned experiments in plains forests, where it was shown that the level of subsoil waters was somewhat lowered? Is it possible that the forest acts in opposite ways in different localities? Before answering this question certain well-known facts may be considered. Suppose a slope at 45,° wooded on its left half and bare or grassy on the right half. In winter both halves are covered with snow, more thickly and evenly so in the forests since there are no avalanches and the wind cannot sweep up or evaporate so much. The springs bring a rapid thaw. On the bare slope where nothing hinders the access of warm air the melting will proceed quickly and the greater part of the resulting water will disappear at once by the streams. It is well-known that in bare or grass mountains the melting of the winter snows causes great and sudden floods like the disasters of 1856. The quantity of water soaking into the soil depends, among other things, on the length of time during which the water remains in contact with the soil. This time itself depends partly on the steepness of the slope. A very steep slope removes the water quickly, so that there is little time left for absorption. Hence steep slopes dry up very quickly after rain, more especially if they are not wooded. On the wooded half of the above supposed slope, the melting will be quite slow, taking a fortnight or a month longer. Thus, even without any low vegetation, the surface flow will be much slower and more prolonged, with a corresponding decrease in flooded streams. But the forest soil always possesses a covering of dead leaves and humus acting like a sponge, able to absorb and hold as much as two or three times its own weight of water which it only parts with drop by drop. The soil below is protected from evaporation and sucks it all into the great benefit of subsoil supplies. The effect is still further increased by the then dormant condition of vegetation, which has no need to absorb any water at that time. The same thing happens during the heavy summer rains, except that the trees this time appropriate a certain share for their own use. If there is actually any water flowing along the surface it is much impeded by the network of roots, stalks, and obstacles of all kinds, so that a given flowing drop has every chance of finding a spot able to absorb it, or a small crevice by which it may get underground. The final result is a great diminution or complete stoppage of surface flow. It is true that during excessive rains or melting of snows, the forests cannot always prevent floods, but in such cases the rise is much less sudden and severe than it might have been, and is due more to enlarged springs and less to erosive surface action.

According to M. Imbeaux, State Engineer to the important Municipality of Nancy, the fraction representing the surface flow due to very heavy rains may be calculated from the rise in the streams effected. He found that in the exceptional floods of the durance on the 27th and 28th October, 1882, the 26th, 27th October 1886, and the 8th, 11th November 1886, the fraction at Mirabeau was ·33, ·39 and ·42, or over a third of the total fall. For less violent rains the fraction were ·27, ·22 and ·18, in accordance with the general law according to which the surface flow follows the intensity of the rain. At the Junction with the Rhone, the figures were very similar but smaller. For the Danube at Vienna, M. Landa found 42·1 per cent, from 28th July to 14th August 1897. It is clear that for a given rainfall the surface flow will be greater as the soil itself becomes steeper and more impermeable or rocky, but the covering of the soil has a powerful influence in all cases.

On this point M. Imbeaux says:—"The re-foresting and returfing of bare mountains at high altitudes are, and have in France been long known to be among the most effectual methods possible for checking excessive surface flow and its consequen

disasters. During the first half of the century the United State of America forgot or disregarded all this, and destroyed their primeval forests at a wholesale rate. They have now seen with their own eyes how their former steady (and regular streams have become transformed into torrents, raging down so long as it rains, and dry for the rest of the year. The matter is proved beyond dispute." Thus wherever man has to fear floods, he should plant forests as his best of all protections. They will give him important other advantages into the bargain as already shown.

The figures given above refer to large basins where the slopes are partly bare, partly cultivated, and partly forests or grass. Figures relating to basins of one kind exclusively would be of value. Since 1860, M.M. Jeandel, Cantegril, and Belland have been making comparisons between neighbouring basins, and they find the tendency to floods to be diminished by one-half in the wooded basins. Their work is not perfect, but it is the best available, the researches of M. Belgrand being worthless on account of defective conditions. The Swiss Forest Research Station is now beginning experiments in this direction in two adjoining basins, one wooded, the other almost without wood. Many rain-gauges will give the true rainfall, and the outflow will be measured in the streams with precision by means of weirs.

The quantity saved from flowing away on the surface can be estimated from the springs, but only approximately. There are many instances of springs drying up or decreasing in quantity and regularity through the clearing of their basins, as also of springs being brought to life again by the growth of forests. There are lists of these in specialist publications, but a few more may here be cited, because they are recent, perhaps little known, and warranted by competent observers. M. Crahay, Inspector of Forests at Brussels, in 1898, quoted instances of the sources of the Sure at Planchimont, &c.:—

"Since the spruce plantation of 35 years back, the flow has become more regular. One which used to be dry all the summer is now never dry, and is now about 220 feet higher up than it used to be. At Bois le Francais, in the commune of Villersdevant-Orval, after the clearance of an old copice with standards, two springs dried up. The place where the water came out, and the little bed it ran in, are still to be seen."

At the international Congress of Sylviculture, held at Paris in 1900, M. Servier, a landowner at Lamure sur Azergues (Rhone), made an interesting communication "On the hydrostatic phenomena following the planting of conifers." The soil is sandy. It was, till recently, almost devoid of wood, a fact tending towards floods and torrents. Wherever a small clump of wood remained, the spot was generally marked by a spring. There is a spring on the western edge of one of these clumps. Every time the coppice is felled the spring diminishes, and as the coppice grows, the spring recovers its volume. M. Bargmann quotes two springs in the communal forest of Storkensohn (valley of Saint Amarin, near Urbes) which dried up when the forest above it was felled, but a new spring appeared about 500 *feet lower altitude* where no fellings had been made. "It is easy to see that the disappearance of forest completely changes the conditions of evaporation and surface flow. Both are increased by disforestment." The only conclusion possible is, that the moisture lost by increased evaporation and quicker surface flow is much greater than the gain by cessation of root-suction.

It was mentioned just now that the portion saved from surface flow could only be *roughly* estimated from the springs. This is because all the water saved does not reappear in springs. Some of it goes as deep as 1,500 to 3,000 feet to form subterranean reservoirs which are available for artesian wells; for instance, the artesian wells of Paris, the supply for which sinks in along the outcrop of the greensand in the basin of the Meuse. Elsewhere the water may sink in till it finds an outlet into some ocean. In some cases, the subterranean water losing its outlet in one basin may work across to another valley altogether, and increase the springs there. Finally, and most important, the soil itself must be considered as a great sponge, the degree of saturation of which varies irregularly according to the abundance and persistence of the rains. If a year begins with a low level of saturation and subterranean waters, and ends with a higher level or degree of saturation, it is evident that the surface flow of that year must have been less than normal, much of the normal surface flow having been absorbed to the benefit of the subterranean supply. Hence, the relation between the actual rainfall and the surface flow in that year will be distrubed, being less than would have been the case if the year had begun with full resources. In the one case the relation will be less than the average, in the other case more. In the one case the budget begins with an overdraft which has to be met, in the other there has been something "brought over."

As the subterranean waters are beyond the reach of all measurement, it can only be judged that when the springs run full, the soil is full, and when the springs diminish, the subterranean reserves are low. So long as the springs remain normal, there is equilibrium. The time elapsing between the disappearance of the water underground and its re-appearance in the springs is very variable. In coarse or fissured soils the springs begin visibly to increase almost as soon as the rain begins. In very compact soils, and when the distance of infiltration is long, the process lasts for years. In the first class of cases just mentioned there may be damage. On steep slopes and in soft loose soils the streams dig deep beds and cut away banks whose removal causes landslips. Good earth is continually being carried away and raw mineral soil exposed. Needless to dilate further on this point. Here, again, the forest is the natural remedy. Across all these little streams living weirs are constructed. These are formed of willow cuttings which soon strike root and produce vigorous shoots. A stout fence is thus produceed which rises as the river bed itself rises, forming a filter through which all the water indeed passes, but its evil impetuosity is ended. In torrent beds of great width trees are planted, such is the alder forest which is so jealously maintained in the bed of the Veneon, where it joins the Romanche. The forest checks the violence of the flow, and compels the deposit of sediment which would otherwise go further down and raise still more the already too elevated bed of the Romanche; these are the best kinds of dams, they cost little to construct and nothing for maintenance. The method is not always available. But it is not adopted nearly so often as it might be. It is only through the action of forests that the rivers arrive at the sea in a steady and respectable manner, having throughout their courses rendered the highest possible services to man, to animals and to plants, by springs, by percolation, by irrigation, by furnishing power, by providing the means of transport, &c.—*Indian Forester*,

F. GLEADOW.

SISAL HEMP AGAIN.

It is as yet too soon to obtain a report of results from the Sisal hemp-growers who last year obtained parcels of plants from the Department of Agriculture, as it takes at least three years before the plants are old enough to yield the first crop of leaves. We have advocated the growing of this valuable fibre, for the reason that poor land not adapted for cereal or root crops can be utilised profitably at very small expense. Some have hesitated to plant, owing to the fear that expensive machinery would be needed

for preparing the fibre; others because such a large water supply is needed. In view of these objections, we place before our readers the statements of Mr. Quenuel, in the Journal of the Jamaica Agricultural Society. That gentleman says:—

I have seen, with a deep regret, some persons rejecting at first the idea of cultivating fibre plants in Trinidad as requiring too much capital and too costly machinery.

This is a great mistake. Yukatan is there as a proof of it, because the Indians of that country export now more than 100,000 tons, prepared with a very rough machine called "raspador," a wheel of 4 feet diameter, working at 160 revolutions a minute. The cost of it cannot be, with horse gear, above 150 dollars. That machine is easy to move from one place to another It wastes a certain amount of material, and is slow at work; but it is not the first time that the primitive appliance of the peasantry has succeeded better than costly machines and big capital, with their heavy interests and annuities. The raspador gives net 333 lb, in ten hours. A machine for working three-quarters of a ton would cost, with steam-engine and the buildings to correspond, £1,200 at least, when five raspadores would not cost more than £150.

A steam-engine would not be moveable and could not be economically established where the area under cultivation would be less than 1,000 acres.

I take my data from various reports from Dr. Morris, Imperial Commissioner of Agriculture, Barbados, and from Mr. Richard Dodge, of the Washington Fibre Investigation Committee on account of the Government of the United States.

From them I come to the conclusion that the fibre plant gives a hemp of a value of £30 a ton in London which I reduce to £14 a ton after allowing for discount, commission, and freight, and also for cultivation and packing. This is less than the amount given in the reports referred to.

I take for planting five rows in 36 feet—that is to say, four at 6 feet distance and the fifth at 12. I put the plant 6 feet apart in the rows, This gives me more than 1,000 plants to an acre. Each plant at four years gives forty leaves a year of a weight of 50 lb., of which 4 per cent. turns into fibre, dried and white, or 2 lb. of fibre to a plant, or 2,000 lb. an acre. £14 a ton is more than 3 cents a lb. I allow only 2½ cents a lb. to make 50 dollars an acre. Thus an acre producing net 50 dollars yields double the results of 200 cacao trees on an acre, at 10 bags per 1 000 trees at 12 dollars net (when 65s. the London market quotation) or 2 bags, 12 dollars=24 dollars. It is a great deal more than 20 tons of sugar-canes to an acre at 9s. a ton, leaving probably not more than 1s. a ton to the cane farmer, or £1 an acre.

If the acre gives 2,000 lb. a year, and a raspador prepares some 330 lb. a day—100,000 lb. a year of 300 days—it will require 50 acres to produce sufficient fibre for one raspador's work in one year; 5 raspadores for 250 acres; 20 for 1,000 acres.

But what strikes me more is that I noticed that on all the sugar plantations, all the cacao estates, everywhere on Crown lands, there is a large extent of useless land, when not first-class. Well, the fibre plants grow nearly everywhere except on absolutely barren lands; and immediately everyone can foresee what is the future of Trinidad when all lands, unless barren, will be cultivated with plants yielding double what cacao gives. One thousand acres of land for sugar-canes, giving 1,500 tons of sugar, will require (if I do not make a mistake) £37,000 worth of machinery, at least; and 1,000 acres of land for fibre plants will require only twenty raspadores costing £600, and will give yearly at 50 dollars, or £10 per acre, £10,000 sterling to repay cost of land and of contracts.

But no industry can be established with safety wit it is not started with economy and perseverance, or if anyone is discouraged because purchasers do not come from abroad to buy the first lb. before it is ready. I believe that this, and five or six years' gambling in the London Exchange, have stopped the first attempt made in Tobago and in Bahamas some ten years ago. But the machines have been greatly improved during the last four years; the prices, after fluctuating during the time of speculation between £13 and £75, have become steady at £30, and the plants, ten years old now, are everywhere giving sprouts from their roots and seeds from their poles.

The Agricultural Society is being called upon to decide regarding the introduction of hard-working immigrants from Teneriffe. Can we find a better basis for settlement by free companies of these free people, in a free country? Profitable contracts could be offered to them on landing at the Quay, at a rate of 25 dollars an acre—5 dollars after brushing, 5 dollars after planting, and 15 dollars on delivery on forth year. Each contractor would not receive more than 12 acres to be planted in three years—4 acres a year. As there is very little trouble in cultivating the fibre plant when it is a year and a half old, every year each contractor could receive some 4 acres more. In five years he would have planted 20 acres, and from the fourth to the ninth year he would receive 500 dollars, whereas 12 acres in cacao, or 2,400 trees. would give him only 480 dollars in the same time [1 dollar = 4s. 2d. 2 cents = 1d.]—*Queensland Agricultural Journal.*

THE RAISIN INDUSTRY OF CALIFORNIA.

The average annual consumption of raisins in the United States for the past five years, has been about 80,000,000 pounds, or not far from one pound per head of population. Practically the total supply was produced in the United States, a supply which only a short time ago was met wholly by importation. No variety of native American grape has yet been developed suitable for the preparation of raisins. Over twenty-five years ago, choice varieties or vines of the raisin grape were introduced into California from Spain, the country from which almost the entire imports of raisins were derived. The industry did not at once assume commercial proportions, but it is notable that so early as 1885, the effects of increased production in California, began to be shown in a decrease of imports. In the fiscal year 1885-86, imports declined to 40,000,000 pounds from 54,000,000 only two years before. Production in California, on, the other hand, began in that year to assume commercial proportions for the first time, and amounted to 9,000,000 pounds, against 2,000,000 in the previous year. The impetus given to the industry at this time was never relaxed; production increased by leaps and bounds until in 1895 the high record mark of 103,000,000 pounds was reached. Since 1895, the raisin production of California has declined, but this it is claimed has been due to adverse climatic conditions, and not to any decrease of interest in the industry. Exports of California raisins first became of sufficient importance to be separately stated in the official reports of United States Treasury Department in the fiscal year ended June 30, 1898. It is estimated by some authorities, that as many as 64,000 acres are devoted to the cultivation of the raisin grape, in the raisin-producing district of California. The city of Fresno, which is known throughout California as the "Raisin City," is a centre of a district which produces about two-thirds of the entire output of the State. Eight months of sunshine and an abundance of water for irrigation make this one of the ideal grape-producing districts of the world.—*Journal of the Society of Arts.*

TOBACCO-GROWING IN CEYLON AND ITS CONDITIONS OF SUCCESS.

We are interested to learn of the visit to Ceylon of a tobacco-curing expert from Borneo and the neighbouring tobacco countries, in the person of Mr. A. Macdonald Gibson who has been spending three months in Jaffna town and district, investigating the industry and samples of the different tobaccos grown on the Peninsula, the Wanni, Trincomalee, Batticaloa and Kandy Districts and testing the "burn," "taste" and "aroma" of each kind. Mr. Gibson was invited to come from Borneo to Ceylon in 1887 to manage a Company then formed to grow tobacco in Ceylon. This Company failed, probably because the Europeans attempted to grow a tobacco to compete with that of Sumatra and Borneo as a cover leaf. Mr. Gibson is of opinion that the aim here should be to improve the tobacco which already grows on the island, and make it into a valuable leaf suitable for European markets, by proper treatment after the tobacco is gathered from the field. This treatment comprises a proper system of "drying" and "curing" of the tobacco, which should be cut only when quite ripe and not—as the native does now—while it is green, so that he may be saved further trouble and expense of watering and other attention to it in the field. The full natural flavour of the Ceylon tobacco ought to be retained, the colour of the leaf improved and the tobacco generally cured so that it will *keep* for any length of time. The native system tends rather to destroy the leaf, while it renders it as black as possible and liable to rot; hence the anxiety of cigar-makers to sell their cigars as soon as possible. At present native dealers and planters are very loath to take up improved methods of curing their crop, possibly not wishing to incur the initial expense that such improvement would involve; and they would, no doubt, prefer that Government, or some large capitalist, or a Company, should show them the way. In the present semi-primitive practices of dealing with the crop, it appears to be almost overlooked that, in one crop even, there are many different kinds of leaf—requiring different treatment—and it is obvious that to get the full market value of the growth, some changes in working are required. There can be little doubt that cultivated tobacco land will largely increase when the Railway runs through the Wanni, and the limited market for local tobacco, as it is at present produced in Ceylon, will be flooded. Prices will drop till the industry will become unprofitable, unless the Ceylon tobacco is rendered acceptable to other markets than would at present receive it.

We trust that this important fact will be carefully noted in anticipation and, whatever the result of the present visit of Mr. Gibson, that at least local producers will look to their methods of treatment and not let the trade in Ceylon-grown-tobacco run the risk of going to the wall. This is a fate that is by no means uncertain, if the industry is not handled in a fashion more suited to modern requirements and the rapidly changing conditions of the country in which it is now turned out. In conclusion we may mention that Mr Gibson has had over twenty years' experience of the tobacco industry in Sumatra, North Borneo and Sarawak, and that he was working a three years' experiment for the Rajah of Sarawak when he visited Ceylon in 1887—so that a better or more experienced adviser could scarcely be found in regard to one of the few important existing industries of the North of the island.

MOSQUITOES AND MALARIA.*

On this subject an important and interesting circular was issued last month from the Royal Botanic Gardens, compiled by Mr. E. Ernest Green, our Government Entomologist. Mr. Green tells us that a careful study of recent investigations on the mosquito-malaria theory affords convincing evidence of a real connection between mosquitoes and malarial fever. The only point in dispute now is: are mosquitoes the sole medium of infection?

Our local medical reports do not specify the number of deaths actually due to malarial fever. Specific, febrile, and zymotic diseases are quoted under one heading. Over 50,000 deaths from these diseases were registered in 1899. It is probable that more than half that number was the result of malarial fever, and a still greater number of persons suffering from this form of fever must have been treated in the Government hospitals of the Island at an immense cost to the country. Besides the actual cost of treatment, there must be reckoned the loss to the Colony of a vast amount of labour, which may seriously delay the progress of important works, such as railway construction, irrigation, &c. In support of this statement, I have been permitted to mention the following facts. At the beginning of December last there were working on the second section of the Northern Railway, some 15 miles from Kurunegala, nearly 600 coolies. Before the end of that same month more than half of them had contracted malarial fever and given up work.

Nor is malarial fever the only disease traceable to the action of mosquitoes. Filariasis, in its various forms, is known to be transmitted through their bites; and in this case both *Anopheles* and *Culex* have been proved to be possible agents. Elephantiasis is one of the forms assumed by filariasis. Excessive anæmia is another. Dr. Manson, in his work on "Tropical Diseases," remarks that "the subjects of filariasis should be regarded as dangers to themselves and to the community, and should be compelled to sleep under mosquito nets." The same remarks apply, with equal force, to subjects of malaria.

In treating of the Life History of the Parasite, Mr. Green gives the main facts as follows:—

When a patient is suffering from malarial fever, his blood is found to contain numerous examples

* Circular.—Royal Botanic Gardens, Ceylon. Series I.—No, 25, December, 1901. Mosquitoes and Malaria.

of the Hæmamœba parasite. If left in undisturbed possession, they will pass through a sexual cycle in the blood of the man, reproducing themselves by fission, *i. e.*, by the breaking up of the mature parasite into a number of spore-like bodies, which will themselves grow to their full size and break up in like manner. Without further interference the disease will be confined to that one person. But if a certain kind of mosquito (of the genus *Anopheles*) bites the patient and imbibes his infected blood, the contained parasites undergo a new development in the body of the insect,—a true sexual cycle,—the parasites becoming differentiated into male and female organisms reproducing young ones in a normal sexual manner. These young parasites find their way through the tissues of the body of the mosquito and congregate in enormous numbers in the glands at the base of its proboscis. Then, should that mosquito bite another person, the parasites are injected into his blood, and once more go through their sexual cycle, the periods of their maturity and reproduction corresponding with the periods of the induced fever. We thus see that the mosquito acts as an alternate host for the parasite. And so the round continues—man—mosquito—man—mosquito—man, in a continuous series.

The "Structure and Habits of Mosquitoes" are next described. About ten genera of the family culicidœ are known in Ceylon, Culex and Anopheles are fully described and distinguished and their habits and haunts make a most interesting study. Then comes the question "How to avoid and get rid of mosquitoes." Preventive Measures, he divides into three sections:—

Firstly.—Those aimed at the extermination of the mosquito.

Secondly.—Those designed for the elimination of the malarial element.

Thirdly.—Protection from the bites of the mosquitoes.

Live or sleep under mosquito curtains where feasible. Allow no standing water anywhere, and on water buts or tanks, a thin film of kerosine is very destructive to the larvæ. These are the broad directions, but Mr. Green gives many hints and explanations upon the value of familiar remedies such as the free use of castor oil leaves and sundry essential oils; *fumigation* with sulphur, the use of white stockings and coverings. Thus, small doses of sulphur, taken internally render one unpalatable to the mosquito. And as to cures for the irritation of the bite it is suggested to moisten and rub soap on the spot. For the treatment of malarial fever when a doctor is not available, Mr. Green quotes Dr. Patrick Manson's advice, and with this we close:—

"During a paroxysm of ordinary intermittent fever it is better, before giving quinine, to wait until the rigor and hot stages are over and the patient is beginning to perspire. A fever fit once begun, cannot be cut short by quinine, and to give quinine during the early stages aggravates the headache and general distress; but so soon as the skin is moist and the temperature begins to fall, the sooner the drug is commenced the better. Ten grains, preferably in solution, should be administered at the commencement of sweating, and thereafter five grains every six or eight hours for the next two or three days. This is almost a certain cure."

The great value of this brief compact circular can only be understood after a careful perusal. Already it is widely appreciated throughout the Northern Province; a recent traveller down the road heard it referred to at several stations in terms of high praise both for its practical usefulness and for the popular treatment of the subject.

TRINIDAD PRODUCTS.

Governor Sir A. Moloney's annual report on Trinidad and Tobago gives some interesting details as to the chief products of that Colony—cacao, sugar and asphalt.

CACAO.—The area under cacao is nearly twice that under sugar, and is extending daily. The crop of 1900 exceed that of the previous year by 1,100,000 pounds, partly due to extended cultivation and partly to a favourable season, but the average prices obtained were about 5s per cwt lower, viz., 68s to 75s. It paid to ship cacao when, in 1896, the prices had fallen to 45s, and the cost of production, apart from rent and interest on capital, is generally estimated at not more than 27s a cwt. Though the world's production of cocoa is being greatly extended, its consumption is increasing rapidly.

SUGAR.—Owing to dry weather the sugar crop of 1900 was a very bad one, and had a shortage of twelve thousand tons. Leaving out of account capital and depreciation charges, it is possible that £1 a ton profit was made on the sale of yellow sugars in the London market. On the other hand, the grey sugars shipped to America were probably sold at an average loss of two shillings a ton on the cost of production. Last year's crop (1901) was above the average, and although the cost of production was reduced considerably below that of the previous year, low prices and heavy imports into the United Kingdom of Continental sugar in anticipation of the new import duty more than neutralized the advantage.

RUBBER.—Rubber is the only new cultivation likely to provide a staple export in the future. It is as yet, however, in an experimental stage. There are some eight plantations in Trinidad and two in Tobago. Several large sales of Crown Land in Trinidad have recently been made on the understanding that they are to be devoted to this cultivation. It is also extending yearly in Tobago, chiefly in combination with cacao. The rubber chiefly planted is the Central American *Castilloa Elastica*, of which there are 100,000 trees planted in Tobago, as well as some thousands of the Brazilian "Mouchet." The former promises to be the most profitable. The West African silk rubber has also been recently introduced, and its importers are hopeful of its success. The greater part of the plantations are still quite young—from one to four years old —and no large return can be anticipated until they have been seven or eight years in existence. The quality appears to be good. A sample of *Castilloa* grown and prepared on this Richmond estate was valued in England by experts at 3s 6d per lb.—*Chamber of Commerce Journal* for January.

PEARL SHELLING IN QUEENSLAND.

There can be little doubt according to the annual report of the British Marine Department, that the pearl shelling industry of Torres Straits has reached a critical stage, and unless some precautions are taken, all the shelling grounds within a distance to be reached from Thursday Island will have been worked down to a payable limit, and the fishery will be practically closed down. Shelling has been carried on in Torres Straits for 31 years.

Apropos of pearls it is to be noted that M. Raphael Dubois, a French naturalist, asserts that all large pearls are nothing but sarcophagi, in the centre of which rest the dead bodies of small marine worms. "If we examine in the month of August molluscs that at certain points along the coast are always full of pearls, we shall be surprised not to find any, or very rare specimens. . . . . But if we find no pearls, we discover, on the other hand, if we observe the mollusc attentively, numerous small reddish yellow points in the precise spot where pearls usually form. They are produced by tiny young distomes about one-half millemetre [one-fiftieth of an inch] in diameter, just about to become encysted. Their encystment takes place in an extremely curious manner. In the beginning we see the surface of the distome sprinkled with tiny grains of carbonate of lime; these granulations grow and take the form of crystals, which group and interlace in different patterns, ending by forming a continuous calcarious envelope around the creature's body, which can still be distinguished by its yellow tint. The calcareous shell takes on polish and lustre, and at this moment the nucleus of the young pearl is seen only as a little black point, which soon disappears. The pearl now has a beautiful lustre, and it continues to grow in contact with the membranous pouc that surrounds the calcareous cyst. We may cause the parasite to reappear by decalcifying the young pearls with hydrochloric acid; we shall then see that there is no doubt at all regarding the nature of the nucleus. It appears from our observation that the *Distomum margaritarum* becomes encysted in the *Mytilus edulis* toward the month of August, and that it so remains until the following summer. At the beginning of this season the pearl loses its polish, decays, and falls to pieces. There may remain only a gelatinous mass, corresponding no doubt to the gelatinous pearls noticed by M Diguet in the *Meleagrina margaritifera*. The parasite then resumes its active life, reproduces its kind, and the young distomes become in their turn encysted, forming new pearls. There are pearls that escape their physiological fate, and may grow to larger size because their distomes are dead, killed by another parasite, or because they are sterile. The most beautiful pearl is nothing but the brilliant sarcophagus of a worm."—*Straits Times*, Jan. 24.

THE TEA TRADE AND INDUSTRY.

Mr Joseph Walker, a well-known authority, writes as follows in the *Grocers' Review*:—

In consequence of the South African War, and the greatly increased normal expenditure of the country, the declaration of the Budget has come to have an interest previously unknown to dealers in tea of the present generation. The unsettlement caused by the dislocation of the finances of the conntry may be a feature in the trade for some years. It may, therefore, not be out of place to refer to the undesirability, even from a commercial standpoint, of buying too far ahead. It is not sufficiently well known that Indian and Ceylon teas, especially of the cheaper and medium classes have not the same keeping properties as the tea that our fathers used. Congo tea still remains good twelve months after arrival, but most Indian and Ceylon teas are flat long before that period is reached, and lack the piquancy so mnch enjoyed by tea drinkers. No intelligent tea house would run the risk of ruining a trade by sending out a well-known brand which was depreciated by age, and it behoves the grocer to be aware, n these days of Budget speculation, that he does not go too far, and lose by one policy any advantage he may have gained by another stroke in his business affairs.

The year immediately under review has been noticeable for the variation which has taken place in the price of common tea. The low prices of the spring were brought about by several causes. They were partly the result of the very high prices which the lowest grades reached in 1899, which induced the planters to send over a superabundance of common tea. A great weight of this class of tea was placed upon the market at a time when the finances of the whole trade were stretched to their utmost limits with operations in view of the approaching Budget, and the price fell to a lower point than it had ever reached before. The result of these low prices was the re-introduction in some quarters of a shilling canister, which had been abolished at the time of the increased duty of 1900. This must be regarded as a mistaken policy as the combining circumstances which produced the low prices were exceptional, resulted in heavy losses to the growers and had no solid foundation in the world of commerce. The present season has seen a great change in this respect. Common tea is comparatively scarce, and the prices are much above those ruling in the spring.

The total import this year is estimated at several million pounds under the consumption, and we may, therefore, conclude that the basis of value which has been established will be maintained for the present, if, indeed a further rise does not take place after the holidays. While "tea for price" has advanced, the medium and better grades are cheap and the quality good. Teas with body and richness have been obtainable at moderate prices and there has been a good selection of heavy liquoring broken teas. Darjeelings still maintain their high prices, the scientific blender finding nothing that will exactly take their place. Viewed as a whole, the crop this year may be said to be of a satisfactory character. There is one point in which the trade seems to be undergoing a change, and in my opinion a change for the better. The grocer is willing to sell tea much smaller in leaf than formerly. As long as it is not "dirty," that is, laden with powdery dust, he seldom complains, however small in reason it is made. This is all to his advantage as it enables the blender to use tea which would not otherwise assimiliate in leaf, and allows a good proportion of thick, rich broken tea, and manipulation by machinery leaves all the blend a uniform size. It is to be hoped that the day is not far distant when "tip" and "style" may be less valued by the average grocer than at present, as there is not one householder in a thousand who regard these properties if only the tea in the tea cup is pleasing to the palate. In maintaining the trade in a healthy condition it is the cup that will tell.

PLANTING PROGRESS IN PENANG.

Paddy harvest is in full swing in the Province, and the crop as a rule an exceptionally good one. Coconuts are short, but the high price in some measure compensates for that. The Para rubber on Bertam Estate, the planting of which was commenced four years ago, look sturdy, and the first field, planted twelve apart, now cover the ground and require little or no further expense before they come into bearing. Bagan Tuan Kechil is being rapidly transformed into a village of bricks and mortar, which shows that a big fire is not an unmixed evil.—*Penang Gazette*, Jan. 24.

TEA IN AMERICA.

New York, Jan. 8.

Invoice trading light; jobbing demand slow, Prices are well sustained, especially for greens.

REVIEW FOR 1901.

The year 1901 opened with 54,881.219 pounds of tea in warehouse, which quantity steadily declined to 39,521,551 pounds on November 30, 1901.

The following table shows the quantity of tea entered for consumption in the United states including both entries for immediate consumption and withdrawals from warehouse for consumption, value and amount of duties, for the twelve months ending June 30, 1900 and 1901:

	Quantity. Pounds.	Value. Dollars.	Duties Dollars.
1900 ..	80,086,369	10,835,048	8,008,637
1901 ..	82,593,537	10,005,430	8,259,354

The imports for eleven months of 1901, ending November 30, were as follows:—

	Pounds.
Chinese Empire	25 692,503
Japan	28,159,849
All other countries	6,798,104
Total ..	60,650,456
Same time in 1900	89,456,696
Same time in 1899	77,517,386

The above shows that Japan supplied 46 per cent. and China 42.6 per cent. of the total imports.

The light receipts and a slight increase (3 per cent. plus) in consumption accounts for a steadily improving market during the year. The close was firm at the best figures.—*American Grocer.*

A RAILWAY TO NYASSALAND.

After some years of effort, our Nyasaland Protectorate is to have a much-needed railway. Surveys were made more than four years ago with a view to the construction of a narrow-gauge line.The foreign Office however, insisted that a special survey of its own should be made, and for that purpose sent out Sir Charles Metcalfe, who spent a year in the Protectorate making a Government survey for a line of 3 feet 6 inches gauge ; and that survey has formed the basis for the concession now granted to the Shiré Highlands Railway Company. This result was not achieved without some opposition on the part of the Crown agents, who naturally wished to carry out the undertaking themselves. Their experiences with the Uganda line, and their railway work on the West Coast of Africa seem, however, to have induced them to hand over the Nyasaland enterprise to the Shiré Railway Company which will employ its own engineers and provide its own material.

One of the directors of the Shiré Highlands Railway Company is Mr. Sharrer, who has taken a leading part in the negotiations which have led to the present concession, and when a representative of the British Trade Journal called upon him recently, he courteously furnished us with some particulars of the railway project and with a map, showing the route the line is to take. Its total length will be a little more than 200 miles, and it is to have a 60 lb. rail. The southern terminus will be at Chiromo, whence the line will run in a northerly direction to Blantyre, a distance of about eighty-five miles. From Blantyre it will run to Zomba, the Residency, and thence almost due north to Fort Johnston to connect with the steam-boat traffic on Lake Nyasa.

The primary object of the railway is to do away with the land porterage now necessary to carry the coffee and other produce of the Shiré Highlands to Chiromo, whence it is conveyed in the river boats of Sharrer's Zambesi Traffic Company down to Chinde, on the East Coast of Africa This system of land porterage is slow, tedious and costly. It has had to be resorted to as the only means of transport, the rapids and falls on the Shire River between Chiromo and McPimbe rendering that section of the river impassable for steam boats. The new railway will therefore be the indispensable connecting link in a line of communication for goods and passenger traffic, which will reach a distance of 900 miles from Chinde into the heart of Africa. As three-fourths of this route will be by steamboat on the Zambesi, the Shire River, and Lake Nyasa, it follows that the least costly system for the conveyance of goods will be at the service of planters of this part of Central Africa. The line may eventually develop the African Lake districts with their abundant native population, which will then be easily brought down to work on the plantations of Nyasaland. Hence Mr. Sharrer anticipates a great development in those districts, especially in the cultivation of coffee and cotton, tobacco and sugar, and other products, whose cost has been increased by the method of transport hitherto available. For cotton, indeed, he anticipates a very important devolopment. Hitherto its cultivation has been almost entirely given up owing to the cost of putting it down at a cheap rate in Europe, yet experiments so far made in cotton cultivation have been highly successful, the quality being equal to that of the Egyptian variety.

In a recent report to the Oldham Chamber of Commerce entitled, "Cotton Growing within the Empire," it is stated by the Secretary to the British Central African Chamber of Agriculture and Commerce, that nearly all the conditions favourable to the growing of cotton on a large scale exist in Central Africa. The plains on the Zambesi and Shire rivers are admirably adapted for the cultivation of the cotton plant, and in the Shire Highlands there are numerous valleys which contain the rich black "cotton" soil so much sought after in India. Every thing is in favour of the growing of cotton as regards land and labour, and the only question would seem to be the one of freight.

So far the main product of the Protectorate has been coffee, though a considerable area is under tobacco and chillies. The future of the Protectorate will be largely due to its rich virgin soil, so well adapted for cotton cultivation, and in which the Protectorate abounds. The new line, it should be pointed out, will affect the economic development not only of the Shiré Highlands, but of the vast plains which border the West Coast of Lake Nyasa, and whose produce will soon have the means of being conveyed cheaply from Kambwe, Bandawé, Kotakota, Livingstone, and other places on its shores to Chinde, for shipment to Europe. Eventually, doubtless, a connection will be made from the north-westward to the great trunk line from the Cape to Cairo,

The probability of larger quantities of produce arriving at Chinde brought up the question of a direct line of steamships between this country and the East Coast of Africa. Mr. Sharrer states that it is the intention of the Shiré Highlands Railway Co. to charter steamers in this country which will run direct to Chinde to convey rails and other materials for railway construction, and he thinks that this traffic may prove to be the nucleus of a direct line running between that coast and London or Liverpool. In any case, the presence on that part of the coast of large quantities of produce brought down by the aid of the new line should be of assistance in furthering the establishment of a line of direct steamers between this country and East Africa as much of the produce would be shipped for the English market.

The construction of the line is to begin, we understand, early in the present year, and it is hoped that its 202 miles of length will be completed in about two years. The company have the concession for twenty-five years, and also the right to construct any branches of the line which may be necessary with a view to opening up adjoining districts, and especially to connect with the Portuguese railway which is projected to run from Quillimane.

With this enterprise another important step will be taken for the development of East and Central Africa. It can hardly fail to exercise a beneficial influence on our general trade with that district, inasmuch as it will open up one of the richest portions of the Continent, which by the development of its natural resources will be placed in the possession of means of purchasing the numerous classes of manufactured goods produced in England, especially many classes of agricultural implements and tools, machinery, engines, cotton manufactures, and hardware. Ultimately there will be a living artery of commerce from the Nile to the Shiré River district, which, according to the reports of travellers, is rich in coal and alluvial gold. It is reported that in the Mariambe and Central Angoniland districts, in the West Nyasa coast region, and in parts of the Shiré Highlands, a gold-bearing quartz exists, and alluvial gold is reported on the Northern Angoni plateau in the West Nyasa district, and at the head waters of the river Bua, just within the Protectorate. With such resources as these, and with a railway to render the whole accessible, the outlook in Nyasaland, which has been well described as an "enterprising, steady going little Colony," is extremely bright, and indicates a region to which our manufacturers and planters may look for flourishing business.—*British Trade Journal*, Jan. 1.

BRITISH TRADE IN 1901.

The trade of the United Kingdom last year reached the grand total value of 870 millions sterling. Of this amount 522 millions were imports, 280 millions were exports, and 68 millions re-exports. Taking the figures collectively they show a decrease of 11 millions compared with 1900. That year, however, was an exceedingly prosperous one throughout Europe, and a period of abnormally high prices. The year's imports were slightly below those of 1900—522,238,986*l.*, against 523,075,163*l.*—Our imports of spices declined by 267,527*l.*, due to lessened receipts of ginger, pepper, and unenumerated spices. In raw cocoa there was a decrease of 107,000*l.*, and in the prepared article an increase of 136,000*l.* The coffee import is at the same time higher by just half a million. The exports for the year show a total reduction of 10.693,000*l.*, and it may at once be stated that 8,501,000*l.* of this was due to a falling-off in raw materials, which, in turn, is due to the reduced price of coal. The next largest decrease is that of nearly six millions in metals and metal manufactures. At all times the December report is one of the most interesting documents to the observant and studious Briternian—if we may use a word which we find in Mr J Arthur Gibson's book on Consumption to designate the English, Scotch, or Irish man. Take, for example, the cotton account. In round figures we imported 42 million pounds' worth of raw cotton last year, and 4½ of cotton manufactures, and sent out of the country cotton piece-goods valued at 66 million pounds, besides 10 millions of other cotton manufactures and 5 millions of the raw stuff; in other words, we supplied our own needs in cotton and returned to the world the original value and as much again, that being payment for the skill and labour put into it. A similar tale might be told about wood; but we seem to use up all the raw jute we get for ourselves, as our exports of manufactured jute goods are just about equal to our imports of the same, while raw jute amounts to over four million pounds' worth. The linen trade is better, for while the imports of flax were valued at 2,606,565*l*, the exports of linen yarns, piece-goods, threads, &c., were valued at over five millions. The country rarely gets credit for its business in manufactured articles. Yet three-fourths of the exports (or 230,000.000*l.*) are manufactured articles, and between a fourth and a fifth (118,000,000*l*) only of the imports are manufactures, the rest (404,000,000*l*) being food, drinks, raw materials, and other natural produce. In short, every man, woman, and child in the United Kingdom spends 5s a week on imported produce, but only 1s of that is on manufactured goods. The bullion and specie account is the smallest for many years. Our imports in 1901 were 32 millions, against 45 millions in 1899, and the exports for the same years 26 and 35 millions. We have to thank the Boer war for this, as in 1899 British South Africa sent us 15 millions' worth of gold, but the value dwindled to 378,626*l.* in 1900, and increased to 1,962,283*l.* last year. It is a pity the Board of Trade does not work out the value of diamonds as well.—*Chemist and Druggist*, Jan. 18.

POISONOUS ENGLISH PLANTS.

In the Year-Book published by that very practical paper, *Farm and Home*, there is, among a mass of useful information, a chapter on the poisonous plants of this country. Some thirty names, among them those of whole families which are more or less noxious, appear in this list, besides the fungi which are known to have toxic properties in a high degree. Has the reader ever felt the physical and mental sensation of plant poisoning? *Experto crede.* It is most unpleasant and disconcerting to the last degree, even though the dose be not severe. The violent, rapid and automatic efforts of the swallowing or receptive parts of the body to get rid of the stuff, the doubt whether this will be accomplished, the utter hopelessness of ordinary countervailing remedies, the feeling of nausea and exhaustion and the mental conviction of stupidity which must accompany accidents of this kind are not to be forgotten.

Fortunately, many poisonous plants have an evil taste or smell; but this is not always the case. Children will eat the seeds of laburnum, for instance, as if they were green peas until the poison begins to take effect; and yew, whether eaten by cattle or in the form of the seeds by human beings appears to be pleasant to the respective tastes of one and the other, though the poison sometimes acts so quickly that horses drop down dead before the stuff is even partly digested. The only cases of plant poisoning now common among grown-up people are those caused by mistaking fungi for mushrooms, or by making rash experiments in cooking the former, of which Gerard quaintly says: 'Beware of licking honey among the thorns, lest the sweetness of the one do not countervail the sharpness and pricking of the other.' But with such a list of toxic plants as our flora can show there is always danger from certain species whose properties are quite unknown to ordinary mortals. Are they equally unknown to the herbalists and that mysterious trade-union of countrywomen and collectors of herbs by the roadside who deal with them? Probably the trade in poisons not used for serious purposes, but for what used in some parts of England to be called 'giving a dose,' a punishment for unfaithful, unkind or drunken husbands, still exists as it did some forty years ago. The collectors of medicinal plants cut from the roadside and rubbish heaps, plants whose 'operations' for good are quite well known and have been handed down by tradition for centuries, cannot be absolutely ignorant of the other side of the picture, the toxic properties which other plants or sometimes even the same plants contain. Foxglove, for instance from which *digitalis* used as a medicine is extracted, is a good example of those kill-or-cure plants. Every portion of the plant is poisonous, leaves, flowers, stalks and berries. It affects the hearts and though useful in cases in which the pulsations are abnormal, its symptoms when taken by persons in ordinary health are those of heart-failure. Thus foxglove is not only a dangerous but a 'subtle' poison.

Among other plants which may cause serious mischief, but are seldom suspected, are such harmless-looking flowers as the meadowsweet, herb-paris, the common fool's-parsley, found growing in quantities in the gardens of unlet houses and neglected ground which has been in cultivation, mezereon, columbine and laburnum. Meadowsweet which is here indicted for the first time so far as the writer knows, among poisonous flowers has the following set against its name:—'A few years since two young men went from London to one of the Southern counties on a holiday excursion, on the last of which they gathered two very large sheaves of meadowsweet to bring home with them. These they placed in their bedroom in the village inn where they had to put up. In the course of the night they were taken violently ill, and the doctor who was called in stated that they were suffering from the poisonous prussic acid fumes of the meadowsweet flowers which he said almost overpowered him when he came into the room. The flowers were at once removed, and the young men, treated with suitable restoratives were by next morning sufficiently recovered to undertake the journey home.' Without knowing what the young men had had for supper, it seems perhaps rather hasty to blame the meadowsweet. But the other flowers mentioned above have a bad record. To take them in order. Herb-paris which grows in woods and shady places, with four even-sized leaves in a star at the top of the stem, all growing out opposite each other, bears a large green solitary flower and a bluish-black berry later. All parts of the plant are poisonous, the berries especially. Fool's-parsley is an unpleasantly smelling, very common plant which leaves its odour on the hand if the seeds are squeezed or drawn through it, is said to cause numbers of deaths by being mistaken for parsley and cooked. In the case of poisoning by this plant it is recommended that milk should be given, the body sponged with vinegar and mustard poultices put on the sufferer's legs. It is reckoned that one plant produced six thousand and eighty seeds, an unpleasant degree of fecundity for a poisonous weed. Columbine which is a wild plant with blue or white flowers as well as a domesticated one, has a toxic principle like that of the monkshood more especially in the seeds, and the pretty red berries of the mezereon are responsible for the death or illness of children nearly every autumn. They are like cherries and easily picked from the low bushes on which they grow. A dozen are said to be enough to cause death though this must probably depend on the state of the eater's health. The laburnum with its golden rain, is potentially a kind of upas tree. The writer has only known of two deaths of children caused by eating the beans in the green pods, but it is said to be a frequent cause of death every year on the Continent, where possibly children are less naturally careful about poisonous plants than those in England to whom risks of this kind are usually and properly made part of the 'black list' of the nursery-book of 'Don'ts.' The seeds will even poison poultry if they pick them up after they have dropped from the pod. Laburnum is of comparatively recent introduction into Britain or it would probably earlier have been accorded a place among the severely poisonous plants dreaded by all.

Of these the deadly nightshade and hemlock are the best known in story, while the yew is most dangerous because far more common. Green hellebore and monkshood are also classed in the list of the ranker poisons. Deadly nightshade is rather a rare plant, yet it may be seen often enough on the sides of woods where there are old walls. Several plants were recently recognised growing on a wall by the roadside between Reading and Pangbourne. It is poisonous throughout. The flowers are large single purple bells and the berries black and shiny like a black cherry. The author of the chapter referred tos at the beginning of this article says of this dangerous plant that the roots are computed to be five times more poisonous than the berries, that human beings have been found more susceptible to it than animals, and carnivorus animals more so than others. Children suffer more in proportion to the quantity of poison taken than do adults. But cases of nightshade poisoning are very rare though two were reported some three years ago. Possibly the berries often fail to ripen, and so are less attractive in appearance. The poisonous hemlocks are two, one of which (the common hemlock) is said to have been the plant from which the Athenians prepared their poison for executing citizens condemned to death and the other, the water-hemlock or cowbane, is

particularly deadly when eaten by cattle, to which it is fatal in a very few hours. Another plant used for preparing poison in India, which produces a drug used by some tribes of Thugs for procuring the death of their victims, datura or stramonium, has now found a place amongst our wild flowers. It has an English name, thorn-apple, and is said to have been naturalised by the gipsies who used the seeds as a medicine and narcotic and carried them about with them in their wanderings. Like henbane it is often seen on rubbish-heaps and in old brickfields. The leaf is very handsome and the flower white and trumpet-shaped. Both this plant and the henbane retain their poisonous properties even when dried in hay, and stalled cows have been known to be poisoned by fodder containing mixture of the latter plant.

Cattle have a delicate sense of smell which warns them of the danger of most poisonous English herbs, though apparently this warning odour is absent from the plants which kill so many horses when the grass grows on the South African veld, and also from our English yew. Yew was anciently employed as a poison in Europe, much as is the curari today in Central America. Dr. W T Fernie, the author of 'Herbal Simples Approved for Modern Use,' says that its juice is a rapidly fatal poison, that it was used for poisoning arrows, and that the symptoms correspond in a very remarkable way with those which follow the bites of venomous snakes. It is believed that in India there is a poison which produces the same effect. An Indian Rajah once desired that a notice should be put in a well-known paper that he did not intend to raise his rents on his accession to the estates. The proprietor of the paper asked him his reasons for wishing for such an advertisement. The Rajah said that his grandfather had raised the rents, and had died of snake; that his father had done the same, and had also died of snake-bite, and that he concluded that there was some connection of cause and effect. The notice was inserted, and this Rajah did not die of snake-bite, or rather of the poison which simulates it.—*Spectator*, Jan. 11.

THE THREATENED INCREASE IN THE TEA DUTY.

The sensitive state of commercial feeling with regard to the intentions of the Chancellor of the Exchequer may find no settled relief until the budget proposals are announced, but we are glad to see that a deputation from the tea industry will wait upon the Chancellor next week. The mystery surrounding everything connected with future taxation is supposed to be profound, but occasionally the Chancellor of the Exchequer unbends and throws a crumb of comfort to those who clamour for it. We trust he may do so in the case of the tea industry. Since the letter of Sir Robert Giffen to the *Times*, and the comments it called forth, there have been no further startling theories put forward on the subject of taxation. One home journal, by the way, has taken exception to the comments cabled here of a Calcutta contemporary which, if its remarks were correctly reproduced, suggested that the Chancellor of the Exchequer, instead of imposing an additional burden on tea, should rather tax cocoa and other produce. These remarks were resented by the home journal, the inference being that it is not the province of an Indian paper to make suggestions affecting British taxpayers, an idea which, if put into practice, would knock the Imperialistic doctrine into a cocked hat.

We do not imagine the Chancellor of the Exchequer needs very many hints even from economists like Sir Robert Giffen. While glad, no doubt, of the opinion of some wellknown authority within the charmed circle of officialism, Sir Michael Hicks-Beach is an old Parliamentary hand, and he knows the taxable capacity of most men and things. He may not just now be very particular as to his victims, but he will show a remarkable disregard of circumstances should he, in the face of the representations made to him, burden the tea industry with any further duty. Even a Chancellor of the Exchequer must have some sense of the eternal fitness of things, and to pile up the load on the shoulders of people already tottering under a heavy weight should be repulsive to his notion of justice and true political economy.

Apropos the brilliant suggestions made by Sir Robert Giffen about taxation, the "Speaker" cites the following passage in one of Sir Robert Giffen's "Essays in Finance." The essay in question is a generous appreciation of Mr Gladstone's work in finance and was composed in 1868, the first year of Mr Gladstone's first Ministry. Mr Giffen, as he then was, thought that there was much still to be accomplished for he wrote: "The duty on corn, the taxes on locomotion, not a few of the stamp duties the fire insurance tax, the tea and sugar duties are all burdens whose abolition would benefit the country and for the most part put money directly into the pockets of the poor." And a complacent footnote is added to the edition of 1880: "The taxes here referred to have almost all been abolished since 1869.' Since 1880 many things have happened and amongst them it is noticeable that Sir Robert Giffen does not think as did Mr Giffen about the tax on tea, for he now suggests that instead of abolishing the tax altogether it should be largely increased.

The meetings held in India and Ceylon show tha tea planters have lost no time in protesting against the danger of the situation. If once the deed be done protestation will be unavailing. The Chancellor of the Exchequer it is argued is not a sentimentalist and he must have money and plenty of it and therefore in case he should take Sir Robert Giffen's hint, it is well to know that the tea planters of India and Ceyon have protested vigorously. It is a remarkable thing that while the British Government is professing the deepest anxiety for the West Indies and sugar producers there and laudable efforts are being made with a view to the relief of the depressed sugar industry, some of our political economists just to show the irony of things seem anxious to bring about disaster to the tea industry of India and Ceylon.—*H. C. Mail*, Jan. 24.

CARDAMOMS IN FRENCH INDO-CHINA.

The *Revue des Cultures Coloniales* of November 5th, in the course of a long article on the cardamoms of French Indo-China, states that the exports to Singapore and Hongkong may be considered as representing the total production of the country, the quantity consumed locally being insignificant. Nearly the whole of the crop is sent to China via Hongkong. It is the Chinese, moreover, in Cambodia, Laos, Annam and Tonkin who buy or exchange the cardamoms with the producers, and then send them to the different ports whence they are exported. This trade is said to be entirely in their hands. The port of shipment for Cambodia and a part of Laos is Saigon, with Cholonas *entrepot* and market. The exports from Annam and the region round Laos go via Vinh, and Tonkin via Haipong. This later port also receives many cardamoms from Annam. The following table

shows the quantity and value of the exports of cardamoms from French Indo-China during the last two years :—

	1899.		1900.	
	Quantity. Kilos.	Value. Francs.	Quantity. Kilos.	Value. Francs.
Annam	14,503	67,968	9,857	74,913
Cochin China and Cambodia	289,074	1,195,002	196,908	632,679
Tonkin	43,127	97,036	54,019	405,142
Total	346,704	1,360,006	260,784	1,12,734
	763,000 (lb.)	54,000*l.*	574,000 (lb.)	45,000*l.*

—*Chemist and Druggist*, Jan. 18.

PRODUCE AND PLANTING.

The enterprise and energy of the Consuls of the United States have played an important part in the development of the trade of America. Doubtless British Consuls are just as energetic but there is something lacking in our system. In 1880 the "Commercial Relations," or Consular Reports, were first issued by the United States Bureau of Statistics, which in 1898 was superseded by the Bureau of Foreign Commerce. For the last three years a daily bulletin has been issued of the more important and valuable dispatches treating extensively of trade conditions. These advance sheets tell of the enterprises and plans of foreign manufacturers and of the changes in tariff regulations and are eagerly read. They call attention to the tastes, habits and prejudices of the peoples who may become customers. They suggest necessary changes of style or in methods of packing to make American merchandise more saleable, and give much other advice. Contrast this with our own Foreign Office methods, or some of them, or rather note the period covered by some of the Consular Reports issued from the Foreign Office. For instance, a report received on December 23, 1901, from the British Consul at Foochow reviews the trade of that port for 1900, and although doubtless admirable in its way, and compiled with great care, is rather too belated to serve any practical purpose. Referring to tea, the report says: "There seems to have been no change in the general quality of the teas proposed in 1900; the quantity brought to Foochow for sale was somewhat in excess of arrivals in 1899, but much remained unsold whereas all the tea brought here the year before found a market. The sales in London resulted in heavy losses, India and Ceylon having overstocked the market, and the prices obtained were the lowest on record. Some business was done in London in Souchongs and Seumoo Congous, but on the whole Foochow teas fared very badly. In America dealers thought that the Boxer troubles would affect the tea production and so bought heavily, the result being the overstocking of the market and sales at a ruinous loss. In short, while about the same quantity of tea arrived in Foochow as in 1899, less was sent abroad and a large amount remained here unsold, while of that which was exported only a very small percentage sold for remunerative prices." The condition of the tea market might have varied a hundred times since the date written about, and all kinds of things have happened, and been forgotten. Of course the Consul has done his duty in the matter, and the fault of the delay is not his in any way, but surely it is possible to gather official information about the Foochow tea market up to a more recent date than 1900 without causing trouble from overwork.

In its comments on last week's tea sales the "Produce Markets Review" says: "At the public sales on Monday of Indian tea the market was irregular and an easier tendency ruled, particularly for the lower descriptions. Later on the demand was more active and the market closed with a fairly strong tone. The quantity catalogued for next week is about equal to that of the present week, and with the improving demand and increasing deliveries, which are 3,750,000 lb, larger since the first of the month compared with the same period last year, there is every indication of steady to firm prices. The exports from Calcutta for the past year amounted to 152,810,000 lb. against 159,390,000 lb. in 1900, while from May 1st, which was the beginning of the season, to the end of December the shipments were smaller. The home consumption for the same periods reached 141,389,000 lb. and 134,933,000 lb. respectively, showing an increase of 9,000,000 lb. The market for Ceylon teas has been severely tested this week, as the sales, following on very large Indian auctions, have shown a considerable increase in quantity. No signs of weakness were apparent, however, the demand being fully equal to the supply, and all kinds were well taken at firm rates, while the lowest grades of whole leaf occasionally sold at ½d more money. The offerings contained a larger proportion of Colombo-bought teas, which consisted principally of leafy broken Pekoes, and, as the quality was very ordinary, many were withdrawn for higher bids."

The latest fad in Paris is the smoking of coffee cigarettes, chiefly by women. The new cigarettes do not contain a compound made of the ground bean, but the leaf of the tree, fine, coarse, or navy cut, or manipulated after the bird's eye method, according to taste. Coffee-leaf smoking is said to be not only perfectly harmless, even if indulged in to the wildest excess, but to possess the property, deemed by the inventors an unquestionable advantage, of imparting to those who practise it an intense and lasting dislike for the flavour of tobacco.

Cocoa and nutmegs continue to maintain the colony of Grenada in easy circumstances, if not in opulence. The annual report for 1900, which has just been issued from the Colonial Office, describes the year as one of much prosperity—a prosperity, happily, that is likely to continue. The cocoa crop was good and the prices in the London market were high throughout the year, whilst the yield of spices was larger than ever before —between two and three times as large as the average annual output for the five years ending with 1897. In 1900 the total value of the colony's exports was £311,000, of which cocoa accounted for £270,000 and spices for £30,000, leaving only £11,000 for cotton, live stock, and everything else. The spice culture is mainly in the hands of large proprietors, who bestow much care and attention upon it and have evidently profited well by the establishment of the botanic station three years ago. Cocoa, on the other hand, is chiefly grown by the peasants on their own small holdings, and they are less respective of new ideas.—*H. and C. Mail*, Jan. 24.

"CEYLON MEN" WANTED FOR NATAL.—At a meeting of the Royal Colonial Institute, held on January 14th, Tuesday night, at the Whitehall rooms, Mr Emile McMaster read a paper on "The High Plateaus of Natal; their Climate and Resources" and the report in the London *Times* winds up as follows:—

He thought there were more small and moderate fortunes to be made in Natal than anywhere he knew of, but no large fortunes, except in coal and iron. He felt well convinced that there were fewer blanks in the lottery of success, and of health and happiness, in high Natal than elsewhere in South Africa; and especially was this the case for those of our race who meant to settle, live, and die, and leave descendants there. The things most lucrative however, called for a few years wait and nursing up; and he thought the class most called for now by the front plateaus was such as had gone planting to Ceylon, young men purposeful and with some capital to bury for a few years.

NEW FIBRE COMPANY.

COFFEE, TEA, OIL SEEDS AND HEMP.

(Registered in Scotland.)

DAURACHERRA FIBRE CO., LTD., (4,997).—Registered at Edinburgh January 8th, with capital £25,000 in £10 shares, to acquire the business carried on as "The Dauracherra Fibre Company," in the Maulvi District of Sylhet, Assam, India, and to carry on the business of growing, manufacturing and selling coffee, tea, oil seeds, sisal, Mauritius and other hemp, seeds and suckers, etc. The subscribers are:— Shares.

J Hunter, Sarona Valley Sawmills, Sylhet, Assam, India, timber merchant ...	1
R Thomson, Dundonald Road, Kilmarnock, engineer	1
J D Mackintosh, Bank Place, Kilmarnock, solicitor	1
J Barr, 39, Dundonald Road, Kilmarnock, engineer	1
J Boyle, 87, Dundonald Road, Kilmarnock, drysalter	1
R Gemmill, 6, Portland Road, Kilmarnock, manufacturer	1
G Morrison, Spotland Lodge, Kilmarnock, confectioner	1

The number of directors is not to be less than 3 nor more than 7.—*Investors' Guardian*, Jan. 18.

TO ALL CEYLON TEA GROWERS,

CROP OF 1902.

The following circular has lately been issued by the Ceylon Association in London:—

Dear Sirs,—I am directed by the Tea and Produce Committee to send you a copy of the following Resolution which was passed unanimously at a meeting held this day:—

RESOLUTION.

"That this Committee, viewing with grave concern the disastrous results that would follow an excessive crop of tea in 1902, strongly urge upon producers the necessity of restricting outturn as much as possible by a system of more careful plucking or otherwise and to avoid more especially the production of coarse tea, which did so much harm to the industry in season 1900."

The above resolution having been unanimously accepted by my Committee, I am desired to give you their reasons for the conclusions arrived at, which are shortly as follows:—

In their opinion the experience of the past two seasons has conclusively proved—

(*a*) That the coarse plucking resorted to in 1900, resulting in a plethora of common undesirable Tea being forced on an already over-supplied market led to a lower level of prices than has hitherto been known, Pekoe souchongs were sold as low as 3½d, a price which must have been well under the cost of production.

(*b*) That on the other hand, the more careful plucking resorted to in 1901, combined with climatic influences, restricted the output to such moderate limits that the market immediately responded.

Messrs. Thomas Cumberlege and Moss, in their circular of the 3rd inst., make the following statement:—

"Of the 187,000,000 lb and 145,000,000 lb respectively produced in India and Ceylon during season 1900-1901, the last 12,000,000 lb from the former country and the last 8,000,000 lb from the latter were at a moderate estimate the actual cause of an aggregate nett loss to producers of over £1,000,000 sterling; this, on the face of it, is an absurd situation, and it is not to be doubted that by individual or collective action some means will be found to prevent its recurrence."

It is, therefore, abundantly clear that it would be a disastrous policy to revert to the system of coarse plucking resorted to in 1900. It would mean that the end of 1902 would see the industry again in a position of great depression equal to or worse than that at the end of 1900.

The position of British grown tea has not, for some years, been so strong as it is now, and this is owing to the certainty of a considerable shortage as compared with the crop of 1900.

Assuming that the home deliveries increase in the same proportion as they have done during the past twelve months, and with the natural increase in demand from abroad, it is obvious that the tea growers have now an opportunity such as they may not have again for years of putting the industry once more on a sound and profitable basis.

An appeal to the same effect as the above is being issued by the Committee of the Indian Tea Association to all Indian Tea Growers.—Yours faithfully, WM. MARTIN LEAKE, Secretary.

BALATA FROM THE LEAVES.

As it is possible to obtain gutta percha from the leaves it was of interest to try also to obtain balata in a similar way. A sample of the leaves was obtained from Venezuela through Mr Englehardt, of Cindad, Bolivar, on the Orinoco, and on this sample the Colonial Committee, at Berlin, experimented. The results of the tests were, however, disappointing, as the product gained was of no practical use. The leaves were cut into small pieces and macerated in chloroform, which gave an extract containing 10·7 per cent. of the total weight of the leaves when the chlorophyll and the valueless resins were removed by alcohol. The insoluble matter represented 5·1 per cent. of the leaves, and was a substance only slightly elastic, light in colour, brittle, and not at all tough. If this substance represented balata it was apparent that the process had destroyed its most valuable qualities.—*India-Rubber Trades' Journal*, January 20.

DISCOVERY OF A NEW TEXTILE FIBRE.

According to the *Bullettin* of the *Bureau of American Republics*, a new fibre known as *aramina*, has recently been discovered by Dr Silva Telles of the Polytechnic School of Sao Paulo. This fibre is obtained from a variety of plants commonly known in Brazil as *carrapichos*. It is almost white in colour, very fine and flexible, and is from two to three yards in length. It has been called *aramina* owing to its almost metallic lustre and wonderful flexibility. The plant from which the fibre is derived is strong and vigorous, and no special care is required in its cultivation, being perfectly adapted to uncultivated lands. It grows wild throughout the entire western part of the State of Sao Paulo and is being cultivated on a large scale on the plantations in the vicinity of Campinas.

Articles made of this fibre was recently exhibited by Dr Telles at the Polytechnic School, Sao Paulo. These included cords, twines, ropes, and canvas suitable for coffee bags.

It is predicted that this discovery will revolutionize the textile industry.

CULTIVATION OF RUBBER.

The following rather racy account of the difficulties lying in wait for the cultivators of rubber trees, is extracted from the pages of the American "Agricultural Gazette." After speaking of the relatively small proportion of people engaged in this direction, the writer goes on to say:—

The difficulties which confront this handful of farmers are peculiar. In the first place, no one ever tried before to make rubber grow as a crop for the market. There are no data, no facts of even the simplest kind to tell these men whether their ideas are the right ones. The natives of the country take no interest in this outside their own particular business, and a man about to establish a plantation has had to start fresh, with his own ideas to guide him; and these latter cannot be said as yet to have become authoritative, for none of tho farms are more than six years old, and the trees must be up that time before the question of growing them can be settled. Rubber planting, then, is not only an absolutely untried undertaking, but there has been nothing of tradition or general knowledge of the subject with which to make a start. If rubber were a delicate tree, or difficult to cultivate, the outlook would be disheartening indeed.

Second, the general conditions are against the planter. The nature of the country throws him entirely upon his own resources, and the climate is apt to be enervating, to say the least. Transportation is a great problem. Labour is scarce and not easy to handle, the native peon of Central America being a mixture of childishness and independence, and a hard drinker to boot. Although strong and active as young men, excellent axemen and better with a spade than any other labourers in the world, they become debilitated very early in life. They have no constitution and must be cared for like children. Furthermore, they look to the patron, or owner, for the settlement of every ill spiritual or temporal. You must keep them sober, get them out of debt, make peace between them and their wives, arrange any infelicities that may occur between them and their neighbours' wives, doctor the whole family and educate the children, if you have time. For the peon is essentially a creature formed for the patriarchal system. With a chief or employer whom they know or respect, the better class of peons become in many essentials ideal labourers—steady, careful, hard-working, quick to catch an idea, faithful to follow it out, entirely honest; their employer's interests become their own. But in order to obtain this desirable state of things a farmer should be a first-rate judge of capacity and character, a fair lawyer, physician and man of business.

A third problem before the farmer of rubber is where to plant. Castilloa elastica, for practical purposes the only rubber in Central America has an extremely varied habitat. It is found at all elevations up to 2,000 feet and in a great variety of soils and locations, with a consequent variation of rainfall. So here, again, the farmer must make a choice, and one upon which his success will probably depend, with nothing to guide him in the making. As regards location, it is conceded that Castilloa needs a tropical climate, a rainfall that can be depended upon, a good drainage, and an elevation of less than 1,500 feet, but these conditions have great latitude of choice.

The most important of the questions relative to the method of planting rubber is the one about which the farmers are most divided, and is probably the most vital connected with its cultivation. It is the question whether to plant in groves in the open or under forest shade. The advocate of the farmer system says that in any other part of the world, if one wants to get a particular crop, it is customary to give the tree or plant all the chance possible. One clears the ground, turns it up, and after the tree is planted keeps all weeds from encroaching upon its light and food space. Why not apply these elementary principles to rubber and plant in ploughed and open land, in groves, like an apple orchard?

The advocate of the forestry system points, however, to the manner in which the tree grows naturally, and says that rubber is found thriving best under shade, in a cool, wet spot, and by "thriving" he says, he means gives the most rubber. The tree will grow, it is quite true, faster in the open than in the forest and you will get your groves of rubber trees more quickly, but the question is, will you get the milk from them? For it does seem to be a fact that rubber found in open pastures will not yield so much milk as those trees growing in the forest where it is cooler and moister. If it could be ascertained exactly what function the milk of the tree performed, one would probably be able to tell how much rain would produce the tree with the largest quantity of rubber. The milk is not a sap, but a latex, which is carried just under the outer bark, and the slightest nick from a pen-knife will be followed by a thick liquid, which if caught on the finger dries at once, leaving a shred or two of pure rubber, like small elastic bands.

There are farms established by exponents of each theory. One can see in Mexico rows of young trees in open cleared land, in every respect like a coffee or orange plantation; and again in Costa Rica the farm consists of rubber trees planted in among the forest trees, only cleared where the growth is very thick, though, of course, the bush is kept down by cutting twice a year. Those who are following these two theories will be relieved when they get their first crop. But at present they are having rather an anxious time of it, for on the one hand it will be expensive business, not to say impossible, to plant shade among those trees in the open, and the rubber may be ruined before the shade comes up; but this course would be imperative should the advocates of the orchard theory find themselves in the wrong. On the other hand, should the forestry people be at fault, it will require considerable skill for the owner of the rubber growing in the forest to cut out the trees and let in the sun without injuring the rubber. Ringing trees at the right phases of the moon, some eminent scientists to the contrary notwithstanding, will go far toward solving the problem for the grower of rubber in the forest and make his position the stronger of the two on the whole, in that he runs the lesser risk, as it is easier to cut out the shade than to put it back.—*The India Rubber and Gutta-Percha Trades' Journal*, Jan. 6.

RUBBER AND COFFEE PLANTING IN COSTA RICA.

We have a letter from Mr. Edwin A. Coles, son of the late Rev. S. Coles, who is a planter in Costa Rica, referring to the death of his lamented father, and his desire to aid the Sinhalese children who wish to place a memorial stone over the grave of their deceased friend. Mr. Coles makes the following reference to planting:—

"I hope shortly to write you an article on the question of Rubber Planting in Costa Rica. It is as is stated in the *T. A.*, in its infancy everywhere, and experience is lacking. I have now been taking stock of other people's experiences and am beginning to form an idea. There is no mistake that Costa Rica is a splendid field for the industry, which though requiring very small capital to begin with, needs, nevertheless, nothing less than personal attention. I have just received from Messrs. Brown & Co. five packages of the "White Ant Compound" delayed somewhere in transmission. To state briefly we are now having terrible hard times in this our 'coffee' country, more especially among the buyers. Competition ran high last season and to make things worse, coffee dropped in the market, resulting in the bankruptcy of about one-

half of the buyers. Apart from this I have pleasure in seeing excellent results from the artificial manuring done last year which has been rather slow in showing itself, but that is the way coffee grows slow and sure."

250 ACRES OF TEA FOR R5,000.

THE SAPAKATI TEA CO., Ld., was put up for public auction on the first instant by Messrs Mackenzie, Lyall and Co., in the Exchange Commercial salerooms. The estate, which is situated at Sibsagar in Assam, consists of three blocks of land comprising 578 12/100 acres, 438 39/100 acres and 50 acres, respectively, the first two blocks being held under two freehold grants from Government and the last mentioned block being held under a potta from Government. Out of the above area 250 acres are planted with tea which is in full bearing, and there are the usual buildings and machinery customary for the working of a tea estate. The attendance at the sale was by no means large, and the bidding was anything but brisk. Babu Hurish Chundra Baghi started with a bid for R1,600, which rose very slowly to R5,500, for which price the estate was knocked down to Mr W C Aldam, of Messrs Cresswell and Co., tea brokers.—*Indian Planters' Gazette*, Feb. 8.

MAJOR WYLLIE AND THE BURMA RUBBER PLANTATION.

PROPERTY TO BE WORTH £7,000 A YEAR.

Major Wyllie, Cantonment Magistrate, Rangoon, whose services have been placed at the disposal of the Punjab Government, leaves by the Calcutta mail steamer on Monday for Mianmir. Last year on the occasion of the Durbar held by the Lieut.-Governor, Major Wyllie's valuable services in connection with the rubber plantation were referred to by Sir Frederic Fryer. In this connection it may be of interest to know that no less than 14,000 rubber trees have been planted at Cambay of which about 7,000 have already been planted out, the remainder being kept in the nursery. In the ordinary course these trees would also have been planted out, but Government propose to extend the plantation so as to take the whole of the land occupied by the Rifle Range at Kokine and the land behind it known as the "Danger zone" The trees can be planted at about 435 to the acre, and if the value ten years hence of 32 acres of land with the trees thereon were to be calculated it would amount to something like seven thousand pounds per annum. The para rubber trees are said to yield approximately ten shillings' worth of rubber each tree per annum for probably 30 or 40 years after their tenth year of growth. The figures, if correct, no doubt represent a very substantial yearly revenue to Government in the future.—*Rangoon Gazette*, Feb. 8.

BASIC SUPERPHOSPHATE (writes Mr. John Hughes under date, 31st January) is turning out a great success. Notices of it have appeared in numerous papers giving satisfactory accounts of its *results* as well as its good composition.

PLANTING NOTES.

VALUE OF LIME ON LAND.—H A P, Pennsylvania, writes to the *American Agriculturist* :—The value of lime consists in changing the chemical and physical character of the soil. By so doing it stimulates the development of the latent mineral plant food, promotes decomposition and renders available organic matter, forming compounds which attract ammonia from the atmosphere. Whether it will pay to lime or not depends largely on the nature and composition of the soil. This should be worked out by the individual after consulting the officers of the state experiment station.—*Planting Opinion*, January 25.

CINCHONA BARK SHIPMENTS FROM JAVA.—The New York *Drug Reporter* this month gives the shipments of cinchona bark from Java to Europe during the last three years as follows :—1899, 5,905,150 kilos; 1900, 5,451,500 kilos, and 1901, 6,399,700, kilos. Commenting on these figure the same journal says :—

It will be seen by the above figures that the shipments from Java during 1901 were much heavier than those during either of the other years mentioned, but notwithstanding this large increase, practically all of the bark that has come forward has been taken by makers of quinine, and most of the manufactured article is said to have gone into consumption.

From the *Chemist and Druggist* we learn that Messrs. C F Boehringer and Sohne, of Waldhof, have issued a leaflet of interesting statistics regarding quinine and cinchona. It gives the imports of cinchona into the U.K. for the past four years, exports from Java, stocks of bark at London and Amsterdam, range of unit and average percentage of quinine in manufacturers' bark offered at Amsterdam. Fluctuations in "official" quinine in 1901 are shown, also the estimated contents of quinine in the bark sold at London and Amsterdam, and stocks of quinine in London.

BRITISH GUIANA AND SUGAR BOUNTIES.—The Demerara *Argosy* is very outspoken on this subject :—

If at the next conference Britain makes it clearly understood that she is prepared to enforce her views on tho injustice of continental bounties to the extent of adopting duties to counteract their effect, in the same way as the United States and India have done, there will be some chance of the representatives of the Powers coming to an amicable and satisfactory arrangement—but we fear not otherwise. This is a matter that affects not merely the West Indies; it is one of vital importance to the United Kingdom and to the Empire as a whole. "Trade follows the flag," we are told by politicians at home, but this is only true to a certain extent. If the "flag" encourages the trade of the country on which it is placed, reciprocity is the natural result; but our experience in this respect has been that the Home Government's policy of laissez faire has been to encourage trade between the United States and this colony at the expense of our commercial relations with the mother country. In this connection it is interesting to note that ten years ago our imports from the United Kingdom amounted to £927,397, while last year they had dwindled to £762,187. On the other hand, the imports from the United States in 1891 amounted to £374,935, and last year they showed an increase to £381,356. These figures are significant enough, and it is but natural that the inhabitants of one country should encourage trade with the country that provides it with a market for its products.

HAPUTALE PLANTERS' ASSOCIATION.

ANNUAL REPORT.

The twenty-sixth annual report was presented as follows :—

At the close of another year your Committee submits the 26th annual report of the Association, of work undertaken in tho furtherance of planting interests generally and matters appertaining to this district especially.

MEETINGS.—Two general and Two Committee meetings have been held, the attendance at which was satisfactory.

TEA.—The past season was an abnormally dry one, and this in addition to the fact that finer plucking has been more general throughout the Island, has resulted in a shortness of crop and a consequent rise in the average price of tea.

Your Committee cannot lay too much stress upon the further adhesion to that latter method of shortening ontput, and are sure that this policy combined with the more thorough exploiting of foreign markets, are the only roal remedies for over-production.

OFFICIAL ESTIMATES FOR 1902.—There are 18,608½ acres of tea in Haputale, 14,806 of which are in bearing, yielding an estimated crop of 5,928,565 lb of tea (black tea 5,783,565, green 145,000) or 400 lb per acre. The estimate for native leaf is 487,000 lb.; this is not included in the above estimate.

COFFEE.—Good crops have been harvested on the few estates where this product is still under cultivation ; a good blossom, too, has been reported and unless a bad attack of disease is imminent a heavy spring crop should be secured.

THE NEBODA TEA COMPANY OF CEYLON, LIMITED.

REPORT.

DIRECTORS:—Messrs. Joseph Fraser, Robert Morison, J G Napier. Solicitors to the Company : Messrs. F J & G De Saram. Agents and Secretaries : Messrs. Somerville & Co.

ACREAGE :

Tea in full bearing	..	383 acres.
„ in partial bearing	..	112 „
Total Tea	..	495 acres.
Forest Land, &c.	..	171 „
Total ..	..	666 acres

The Directors submit their Report and Accounts for the year ending 31st December, 1901

The Crop secured for tho year was 209,047 lb., 9,047 lb. in excess of the estimate, or an increase of 14,447 lb., over 1900, and was sold in Colombo at an average rate of cts. 30·341 per lb., as against cts. 28·82 for 1900. The cost of production, including manuring, was cts. 25·673, or exclusive of this item cts. 22·148.

The 247 acres of Tea in full bearing gave an average yield of 587 lb., and the 248 acres of Tea in partial bearing an average of 258 lb. per acro, the youngest Tea 112 acres gave 230 lb. per acro, and 136 acres 280 lb. The average for the whole estate was 422 lb. per acre.

The estimate for 1902 is 230,000 lb., and is based upon medium fine plucking being adhered to. After writing off R1,801·13 for irrecoverable Coast Advances, the balance at credit of Profit and Loss was R9,030·35 which sum tho Directors recommend should be disposed of in payment of a dividend of 3 per cent, and that the balance be carried forward to noxt year's accounts.

In terms of tho Articles of Association Mr. Robt. Morison retires from the Board, but is eligible for re-election.

The Meeting will appoint an Auditor for the current year.

By order of the Directors.
SOMERVILLE & Co.
Colombo Jan. 25th, 1902. Agents and Secretaries.

PITAKANDE TEA COMPANY OF CEYLON, LIMITED.

ACREAGE.

Tea in full bearing	..	760 acres	
„ in partial bearing	...	50 do	
„ not in do	..	220 do	
			1,030 cres
Cardamoms in bearing	..		44 do
Cocoa in bearing	...		84 do
Fuel Trees	..		26 do
Total cultivated area			1,184 acres
Forest and Grass Land...			227 do
Waste Land and Buildings			30 do
Total area of Estate			1,441 acres

The Directors submit their Report and Accounts for 1901.

The tea crop secured amounted to 387,470 lb, being 182,769 lb. less than last year. The net average price realized was 38·40 cents, whilst the cost f.o.b. was 30·391 cents, including manuring and burying prunings, or 23·942 cents exclusive of these items.

The sum of R2,500 received as Premium on 10 new shares issued has been placed to credit of the Reserve Account.

The net profit for the year, including a balance of R3,792·24 from 1900, amounted to R31,932·22. An interim dividend of 4 per cent has been paid, and the Directors recommend a final dividend of 4 per cent making a total of 8 per cent for the year, and that, after transferring R5,000·00 to the Reserve for Extensions, the balance of R2,132·22 be carried forward to next year.

In terms of the Articles of Association Mr Robert Morison retires from the Board of Directors, but, being eligible, offers himself for re-election.

The appointment of an Auditor for the current year rests with the meeting.

AGRA OUVAH ESTATES COMPANY, LIMITED.

ACREAGE.

DECEMBER 31ST, 1901.

Agra Ouvah.		
Tea in full bearing	..	302 acres.
Tea not in bearing	..	20 „
Grass and jungle	..	9 „
Total Estate		331 acres.
Fankerton.		
Tea in full bearing	..	165 „
Timber clearing	..	10 „
Grass, Patana and Scrub	...	18 „
Total Estate		193 acres.
Grand Total		524 acres.

The Directors have now to submit to the Shareholders the accounts for the past year.

The crop secured amounted to 326,420 lb., being 17,330 lb. short of the estimate, which is attributable to an unfavourable season for the flushing.

The average nett price obtained for tea was 45·65 cents per lb., against 45·02 cents per lb. in 1900. After deducting the cost of manufacturing outside leaf, the cost of laying down the Company's tea in Colombo was 24·80 cents per lb. The Directors, considering that the interests of the Company would be best served by confining their attention to manufacture of the Company's leaf only, discontinued the

manufacture of outside leaf from the end of July last, up to which date a sum of R6,223·69 was obtained for this work.

In view of the fact that depreciation has been written off so that Machinery and Buildings now stand in the books of the Company at a sum of R26,058·70, the original cost being R90,846-87, and that all repairs and alterations are now charged to Working Account, the Directors consider that it is unnecessary and inadvisable to write off anything further to Depreciation Account.

The amount at credit of Profit and Loss Account for the year's working is R66,785·24, equal to 17·80 per cent on the paid up Capital of the Company, to which must be added a sum of R2,783·92 brought forward from 1900, making the total profit available for distribution R69,569-16. An interim dividend of 7 per cent was paid on 2nd August last, absorbing R26,250, and the Directors now recommend the payment of a final dividend of 11 per cent, making 18 per cent for the year, and that the balance of R2,069·16 be carried forward to the current seasons' working.

During 1901 a bungalow was erected at a cost of R2,451·27, which has been debited to Capital Account; this building has been leased to Government for a Post Office, for a period of 5 years on a monthly rental of R35.

The estimate for this year is 343,750 lb. Tea on an expenditure of R84,852·97, including a sum of R6,889 for manuring.

During the past year Mr Jas. Forbes resigned his seat on the Board, and Mr Jas. Polson was appointed to fill the vacancy. In terms of the Articles of Association Mr Polson retires by rotation from the Office of Director, but is eligible for re-election.

The appointment of an Auditor for the current year rests with the Meeting.—By order of the Directors,

WHITTALL & Co.,
Agents & Secretaries.

Colombo, Jan. 24, 1902.

THE GLASGOW ESTATE COMPANY, LIMITED.

REPORT OF THE DIRECTORS.

ACREAGE.

Tea in full bearing	..	570	acres.
Do partial bearing	...	68	,,
Do not in bearing	..	12	,,
Grass	...	2	,,
Jungle, &c.	..	62	,,
Total Estates	...	714	acres.

The Directors have now to present to the Shareholders their annual report and the accounts of the Company for the past year.

The Tea Crop, which was slightly under the estimate, amounted to 361,189 lb, and realized a nett average price of 43·66 cents per lb, as against 44·63 cents per lb, last year.

As buildings and machinery now stand in the Company's books, after deducting the sum standing to the credit of depreciation account, at only R22,730·77, a sum far below their actual value, the Directors consider it unneccessary to write off any depreciation this year

The amount at credit of Profit and Loss account for the year's working was R65,548.56, equal to 20·17 per cent on the paid-up Capital of the Company. The sum of R502·53 was brought forward from 1900 account from which falls to be deducted R300, being extra fees to the Directors for 1900 working, in terms of the resolution passed on 18th February, 1893. There is thus an aggregate of R65,751·09 available for distribution, and the Directors now recommend that R5,000 be transferred to Reserve Fund for Equalization of dividends, that a final dividend of 11 per cent be paid for 1901, making with the interim dividend of 7 per cent paid on 2nd August last a total of 18 per cent for the year, and that the balance of R2,251·09 be carried forward to the current year's account.

To deal with manufacture of the increasing crops from the young Tea, an extension to the factory and machinery was necessary, and this work was completed during the year and charged to Capital account.

The estimate for the current season is 400,000 lb. Tea against a total expenditure of R96,542·59.

During the year the Mr Jas. Forbes resigned his seat on the Board and Mr G C Walker was appointed to the vacancy. In terms of the articles of Association, Mr Walker retire from the office of Director, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

By order of the Directors,
WHITTALL & Co.,
Colombo, Jan. 27th, 1902. Agents & Secretaries.

MAHA UVA ESTATE COMPANY.

THE DIRECTORS' REPORT

as follows was submitted :—

DIRECTORS.—Messrs. G H Alston, S. Bois. Jas. Polson.

Estate Inspector.—Mr. Jas. Polson, Estate Superintendent.—Mr. C W Maclean.

ACREAGE.

Tea in full bearing	...	592	acres.
Do. partial bearing	..	26	do.
Cardamoms	.	89	do.
Fuel	..	20	do.
Total Cultivated	..	727	do.
Jungle and Waste land, &c.	..	231	do
Total of Estate	..	958	acres.

The Directors have now the pleasure to place before, the Shareholders accounts for the past year.

The Tea crop secured, including Tea made from 31,316 lb purchased leaf, amounted to 237,583 lb as against an estimate of 262,000 lb of Tea. Following an abnormally favourable seasons of flush during 1900 it was not to be expected that yield in 1901 would be as large, but the estimate would probably have been secured had it not been for the very unfavourable weather experienced during the last three months of the year. The season being favourable for this product, the Cardamom crop amounted to 7,922lb as against an estimate of 6,000lb. The average net price realised for the tea was 34·78 cents per lb and for the Cardamoms sold to date R. 1·25 per lb as against 36 04 cents and Re. 1 42 respectively for the 1900 crops.

A sum of R5,030·50 was spent on capital account in building new Lines, the purchase of a new Roll Breaker and in fitting the Factory with Sirocco Fans, the results of their working having proved very satisfactory.

After allowing for depreciation on Machinery and Building the amount at credit for the year's working is R18,348 21, equal to 6·11 per cent on the paid up capital of the Company. The balance brought forward from 1900 amounted to R10,663·95, thus making a total of R29,012·17 available for description. An interim dividend of three per cent was paid on 8th August last absorbing R9,000 and the Directors recommend the payment of a final dividend of 4 per cent, making 7 per cent for the year that the sum of R5,000 be transferred to a Reserve Fund for the equalization of dividends, and that the balance of R3,012·17 be carried forward to the current year's account.

The estimates for this year are 262,000lb. Tea and 9,000lb. Cardamoms on an expenditure of R71,609.

During the year the Hon Mr W H Figg resigned his seat on the Board and Mr G H Alston was appointed to fill the vacancy. In accordance with the Articles of Association Mr Alstou now retires, but is eligible for re-election.

The appointment of an Auditor for the current year rests with the Meeting.

THE UPPER MASKELIYA ESTATES COMPANY.

Messrs. G H Alston, Jas. Polson and W D Gibbon.—Directors.
Etatate Superintendent.—Mr L A Wright.

ACREAGE.
December 31,st 1901.

	Brunswick and Bloomfield.		Caskieben.		Total.
Tea in full bearing...	446	..	207	...	653
Tea not in bearing..	10	...	—	...	10
Grass, Timber Trees, &c	62	...	—	...	62
	518		207		725

The Directors have now the pleasure of laying before the Shareholders the accounts of the Company for the past year.

The crop amounted to 338,466lb. Tea, being 18,467 lb. in excess of the estimate, and sold at an average net price of 44·61 cents per lb as compared with 42·57 cents per lb in 1900; this price included the grant for green teas, for the manufacture of which a contract at very favourable rates was made.

As Buildings Machinery now stand in the company's books at only R13,796·03 an amount far below their real value, the Directors do not cousider it necessary or advisable to write off any more for Depreciation.

The amount at credit of the year's working is R56,520·70, equal to 16·14 per cent on the paid up Capital of the Company, to which had to be added R2,544 16 brought forwad from 1900, making a total, available for distribution, of R59,064·86. The Directors now recommend that a sum of R5,000 be transfered to the Reserve Fund for the equalization of Dividends, that a final dividend of 60 per cent be paid, making with the interim Dividend of five per cent on 31st July last a total of 15 per cent for the year, and that the balance of R1,564·88 be carried forward to the current year's working.

The Estimate for the present season is 340,000 lb. tea on an expenditure of R95,854,·50, which includes a sum of R12,262 to be spent on manuring.

During the past year the Hon Mr W H Figg resigned his seat on the board, and Mr G H Alston was appointed to the vacancy. In accordence with the articles of Association, Mr G H Alston now retires from the Board, but is eligible for re-election.

The appointment of an Auditor for the present year will rest with the meeting.–By order of the Directors,

WHITTALL & Co.,
Agents and Secretaries.

Colombo, Jan. 27, 1902.

BATTICALOA PLANTERS' ASSOCIATION.

THE ANNUAL REPORT.

In submitting the Second Annual Report of the Batticaloa Planters' Association, your Committee is able to congratulate you on the satisfactory position of the Association. The roll of subscribers is a satisfactory one. This Association represents considerably over 14,000 acres and a capital of not less than R4,250,000. The attendance of the members at our meetings has been good, and our proceedings have been followed with keen interest. It is clear that an Association was urgently needed in this district as previously there was no public body who would undertake the thankless task of airing public grievances and support the planting industry of Europeans and natives alike.

DUTCH CANAL.—This Association has addressed Government on the matter time after time. As the Dutch Bar Scheme has been rightly abandoned there is every chance of having the matter settled definitely, as Government has appointed a Commission to enquire into the matter. The re-opening of the Dutch Canal has been approved of by almost every Governor and by the residents in the district. It is a matter of regret that some Government officials put obstacles in the way of a scheme which will benefit the district to an extent which will amply justify the construction of the Canal. Our best thanks are due to the Press, and particularly so to the Editors of the *Ceylon Observer* and the "Times of Ceylon," for the way in which they have supported this Association in this matter.

HOSPITAL WARDS FOR PAYING PATIENTS.—Our thanks are due to the Government, who have granted the construction of two Wards. It is to be hoped that the building operations will be started without delay.

WATER SUPPLY FOR THE TOWN.—Your Committee regrets to state that nothing has been heard of this matter since H.E. the Governor was last at Batticaloa. Government should be urged to devise a wholesome water supply for the town.

SANITATION OF THE TOWN.—Very little attention seems to have been paid by the Local Board authorities to this important matter. But the thanks of the Public are due to the efforts of the medical officers to bring about a better state of affairs.

DRY DOCK.—It is satisfactory to report that H.E. the Governor has very kindly promised the Batticaloa Steamboat Syndicate every help and assistance. The dock appears to have been finished, and it is likely that the steamers will soon be able to resume their regular service to Kalmunai.

MOTOR CARS.—The arrival of Motor Cars conveying the mails and passengers to and from Lunugalla will add considerably to the advancement of this Province. The regular service will be commenced on the 1st of May.

ROADS.—Complaints about the state of Roads, Bridges and Causeways have been frequent and continual.

SURVEY DEPARTMENT.—This Province, one of the largest in the Island, has not the privilege of a Superintendent of Surveys. Consequently Government surveys have to be done by private surveyors. Your Committee begs to advise that this Association take immediate steps to get a resident Superintendent of Surveys appointed as heretofore.

COCONUTS.—The crops at the beginning of the year have been considerably affected by the drought of the preceding year. However, during the last 6 months considerable improvement has taken place, and copra has risen greatly in price. A large acreage has been brought under cultivation and is sure to attract European capital to this Province.

PADDY.—An average crop has been reaped during the year. A similar crop is expected for 1902. The large irrigation schemes North and South of Batticaloa will add considerably to the acreage already under cultivation.

CHANGES IN THE CIVIL SERVICE.—Your Committee begs to congratulate the Hon. C A Murray, the former Government Agent, on his promotion in the service, and our thanks are due to him for the courtesy, great help and encouragement he has always given to our Association. We are glad to see that his successor, Mr. S Haughton, is likewise giving this Association every help and assistance, for which we are much indebted.

OBITUARY.—Your Committee begs to record with great regret the demise of Mr. W T Wambeek, a valued member of this Association and much respected in the district.

HEWAHETA PLANTERS' ASSOCIATION.

ANNUAL REPORT

There were three Committee meetings and three General meetings held during the year.

FINANCES.—The balance to credit of the Association is R263·33, as compared with R135·87 at end of last year.

MEMBERSHIP.—Includes nine estates in Upper, and eight estates in Lower Hewaheta. Your Committee

regret that there are still a few estates that have not joined. The Galaha Group of estates (5) has seceded from the Association to the Kandy Districts Association.

CROP ESTIMATE—for 1902 is 3,132,000 lb from 7,231 acres, without including 511,000 lb green leaf from native gardens.

SEASON.—This has been an unfavourable one owing o the abnormal duration of the S W Mousoon which checked flush.

MAIN ROADS.—These are in fair order. Your Committee wish to thank Government for carrying out their suggestion of improving and widening the zigzags on the Hanguranketia Road, and would again urge upon Government the desirability of connecting the Upper and Lower Hewaheta district, by joining the two cart-roads now ending on Looleccndera and Rahatungoda, respectively—a distance of some 5 miles.

MINOR ROADS.—The bridle path from Upper Hewaheta, *via* Rookwood, to Nuwara Eliya, and the connecting branch from Lower Hewaheta, through Loolecondera, *via* Camnethan, is proving itself a most useful outlet.

RIFLE CORPS.—A section has been formed, and there are now some 24 members on the roll, and it is hoped that more will join.

TELEGRAPH OFFICE (Deltota).—Your Committee desire to thank the P M G for the speedy construction of the line, which is now completed. We trust, when this office is opened Government will see the utility of connecting the Deltota and Maturata offices affording an office at Hewaheta, and an alternative route from Nuwara Eliya to Kandy. We regret that building difficulties have delayed the opening of this office.

DELTOTA HOSPITAL.—We regret that the P. C. M. O. has not seen his way to carry out the improvements recommended by our Hospital Visitor.

LABOUR.—Labour is on the whole fairly satisfactory, but the evil of bolting coolies is on the increase, and your Committee is glad to note that the Parent Association is moving in the matter.

TATAPARAI TICKET SCHEME.—Your Committee recognises the usefulness of the scheme, and advise members to give it a full trial.

BENEVOLENT FUND AND HATTON NURSING ASSOCIATION.—Your Committee would be glad to see these meetings with more general support.

P A CHAIRMANSHIP.—Your Committee trust that all members of its Association will vote for Mr. A C Kingsford.

OBITUARY.—It is with deep regret we have to record the death of Mr. T N. Orchard, an old and respected resident who was a member of this Association from its inception.

The report was adopted.

THE HIGH FORESTS ESTATES COMPANY, LIMITED.

REPORT OF THE DIRECTORS.

DIRECTORS:—Messrs. J G Wardrop, G B Leechman, G H Alston. Estate Inspector—Jno. Gordon, Estate Superintendent—D Lyall.

ACREAGE.

Tea in bearing	.. ..	683 acres.
Tea in partial bearing	..	497 ,,
		1,180 ,,
Forest and Patana	.. ..	452 ,,
Total	.. ..	1,632 ,,

The Directors have now to submit to the Shareholders the accounts of the Company for the past year.

Owing to the very unfavourable weather during the months of November and December the yield has not realized expectations: the crop secured being 366,418 lb. Tea, as against an estimate of 402,000 lb. the quantity of Tea made in November and December being practically the same as that made in 1900, though the acreage being plucked was considerably larger.

The nett price realised shows a regrettable decline from that in 1900, being 46·30 cents per lb. against 57·05 cents per lb. It should however be pointed out that the increase in crop is derived solely from the young fields coming into bearing and, as is well known, teas from such leaf, until the bushes have matured, are always thin and lacking in point, while, as is usual when common teas are in demand and fetch comparatively high prices, better classes of tea suffer.

The Directors regret to report, that, since the beginning of this year, one gang of coolies has left the estate owing a sum of R2,161·44, and there is another gang R1,547·74, the recovery of which is considered doubtful; they think it advisable, owing to the legal and other difficulties in recovering such debts, to set aside the sum of R3,750 to provide for the possibility of the advances being lost, and have therefore transferred the amount to the credit of a Coast Advance Reserve Account.

After making this provision and writing off a sum of R12,605·25 for Depreciation of Buildings and Machinery, the amount at credit of Profit and Loss Account for the year's working is R51,439·97, equal to 5·41 per cent on the paid up Capital of the Company, to which has to be added the balance of R17,009·24 brought forward from 1900. The Directors now recommend the payment of a final dividend of 2½ per cent, making with the interim dividend of 2½ per cent paid on 16th August last, a dividend for the year of 5 per cent, and that the balance of R20,949·21 be carried forward to the current year's accounts.

Negociations are still proceeding as regards an outlet road to join the Uda-Pussellawa Railway, and the provisions of the Ordinance now before the Legislative Council, in connection with estate roads, should considerably facilitate matters. The Directors are at present reserving the Capital uncalled on the part-paid shares for the purpose of paying for such road.

During the past year the total expenditure on Capital Account amounted to R21,589·86, for the upkeep of young tea not yet in bearing and for additions to machinery necessitated by the increase in crop.

The estimate for the current year is 429,000 lb. Tea on an estimate of R115,799·33, and on Capital Account R12,246, for the erection of new permanent lines, upkeep of young tea and alteration of water-course to provide increased power.

During the year the Hon. Mr. W H Figg and Mr. F W Bois resigned their seats on the Board, and Messrs. G H Alston and G B Leechman were appointed to fill the vacancies.

In terms of the Articles of Association Mr. J G Wardrop now retires from the Directorate, but is eligible for re-election.

The appointment of an Auditor for the current year rests with the Meeting.

THE KALUTARA COMPANY, LIMITED.

THE DIRECTORS' REPORT

was submitted as follows:—

DIRECTORS—J G Wardrop, Esq., Hon. Mr W H Figg, R S Templer, Esq. Estate Inspector—E D Harrison, Esq. Estate Superintendent—W A Lyford Esq.

ACREAGE.
31st December, 1901.

Tea in bearing	...	658
New Clearings	...	24
Areacanuts, Grass, Ravines, &c.		10
		692
Forest	... ...	392
	Total ..	1,084

The Directors herewith present their Report and the Accounts for the year ending 31st December, 1901.

The Crop (including 4,638 lb manufactured from purchased leaf) was 320,569 lb against an Estimate of 324,715 lb which in view of the generally unfavourable season for flushing may be considered satisfactory.

The average net price realized was 30·62 cents per lb against 31·32 cents last year.

The cost of the Tea laid down in Colombo was 23·48 cents per lb of which R8,017·84 was spent on manuring.

On Capital account a sum of R3,143·58 was spent on extending Rubber cultivation, building permanent lines and the upkeep of small acreage of young tea not yet in bearing.

A Census of the Rubber trees on the Company's properties has been taken, and exclusive of last year's plants, the total is 11,883. During the current year provision has been made in the Estimates for planting 30 acres of this product.

After making ample provision for Depreciation of Buildings and Machinery, and paying the 7 per cent dividend on the Preference Shares, the balance at credit of Profit and Loss Account for the year's working amounts to R7,924·62. The sum available for distribution is R14,885·38, out of which the Directors recommend the payment of a dividend for the year of 2½ per cent on the ordinary shares, leaving R4,885·38 to be carried forward to the current season's working.

For 1902 the tea crop is estimated at 315,862 lb. on an expenditure of R75,942·34, which includes an amount of R8,605·20 to be spent on manuring.

On Capital Account an expenditure of R4,783·56 is estimated, principally for opening the Rubber clearing referred to above and the erection of new permanent lines.

Mr. H Cumberbatch on leaving the Island resigned his seat on the Board and Mr. R S Templer was appointed to the vacancy.

In terms of the Articles of Association, Mr. J G Wardrop now retires from the office of Director, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

GANGAWATTA ESTATES COMPANY OF CEYLON, LIMITED.

REPORT OF THE DIRECTORS.

Messrs. T G Hayes, S H Hayes, W Anderson J Shelton Agar and T S Grigson—Directors.

ACREAGE :

Tea in full bearing	..	335 acres
,, partial bearing	...	2 ,,
,, not in bearing	..	8 ,,
Grass and Ravines	...	10 ,,
Total	..	355 acres

The Directors beg to submit their Fifth Annual Report and Statement of Accounts for the year ended 31st December, 1901.

The total crop of tea secured for the year amounted to 166,182 lb. against an estimate of 170,000 lb. The short fall may largely be attributed to the unfavourable weather which prevailed during the latter months of the season, but a part of the shrinkage may also be put down as the result of the finer system of plucking that has been adhered to throughout the year.

The whole of the crop, with the exception of 12 lb. carried forward to next season, was sold in Colombo, and realised R64,183·19, or an average of 38·62 cents per lb. as compared with 36·07 cents the previous year, while the cost of production, including 1·77 spent on manure, works out at 26·60 cents per lb.

Sixty-four acres, chiefly on the Bitterne division, were manured during the year with good effect on the bushes, and the estates are reported to be looking well.

The working account shows a net revenue of R20,245·54, to which has to be added R1,140·06 brought forward from last season. An interim dividend of 3 per cent has already been paid, and after allowing for interest on Mortgage, Superintendent's commission, Secretariat and other items, there is an available surplus of R11,848·00, which the Directors propose should be dealt with as follows :—

In payment of a Final dividend of 4 per cent ..	R7,140 00
To credit of a Reserve Account	2,500 00
Balance to be carried forward to next year, subject to Directors' Fees, and provision for depreciation of Machinery	2,208 00
	R11,848 00

The estimate for the current season points to a crop of 170,000 lb. expected to cost R45,224·75, including R4,040·00 for manure.

The accounts have been charged with the balance cost of reconstructing the wire bridge destroyed last season.

In terms of the Articles of Association Mr T G Hayes retires by rotation from the Board of Directors and is eligible for re-election.

The appointment of an Auditor for the current year rests with the meeting.

RUANWELLA TEA COMPANY.

ANNUAL REPORT.

After the usual preliminaries, the annual report was submitted as follows:—

Directors :—Mr H J Scott, Hon Mr W H Figg, Mr J P Anderson; Estate Inspector.—Mr J P Anderson, Estate Superintendent.—Mr D I Mackenzie.

ACREAGE.

Tea in full bearing	374 acres.
Jungle and Wasteland	199 ,,
Total	573 ,,

The Directors have now to submit to the shareholders the report and accounts of the Company for the past year.

Most estates in the Kelani Valley are short of their estimates for last year, and the Company's property is no exception to the rule, the crop secured amounting to only 166,300 lb of 33,700 lb short of the estimate. The Directors feel convinced that this unsatisfactory result is attributable primarily to an unfavourable flushing season, and, to a smaller extent, more careful plucking.

The average nett price realized was 27·83 cents per lb., whilst the cost of production was 23·89 cents per lb., of which R3,466 05 was spent on manure, and a sum of R1,055 on purchasing a wire shoot and a new tea sifter.

As Buildings and Machinery only stand in the Company's books at R25,851·57, a sum far below their actual value, the Directors do not consider it necessary to write off any depreciation this year.

After writing off R725·58 for bad coast advances, the sum at credit of Profit and Loss account is R3,573·68, to which falls to be added R6,783·02 brought forward from last year, and R196·81, being under-estimated value of Tea appearing as unsold in last year's account. The amount available for distribution is therefore R10,553·51, and the Directors recommend the payment of a dividend for the year of 3 per cent, and that the balance R2,603·51 be carried to the current season's account.

The crop estimated for this year is 200,000 lb. Tea on an expenditure of R46,232·66, which also provides for the planting up of Para Rubber on certain portions of the estate where it is considered that the cultivation of this product is likely to be profitable. The building of a permanent set of lines is also provided for.

In accordance with the Articles of Association, Mr Hercules J Scott now retires from the Board, but is eligible for re-election.

The appointment of an Auditor for the current year rests with the meeting.

INDIA-RUBBER AND GUTTA-PERCHA AND ELECTRICAL TRADES' JOURNAL.

RUBBER PLANT.—A good few people just now are troubling their heads about the plant. We do not refer to that which has leaves and makes a nice ornament, but to the mass of wood and iron, in all sorts of shapes and sizes. that constitutes a rubber factory. Some of it is fixed and immovable, except in the way for which it was made ; some of it, and a much larger portion than outsiders would dream of, is loose, and changes its location frequently. It is clear that the latter runs more risk of getting injured or lost than the former ; but, on the other hand, breakages in the fixed plant are usually of much greater importance when they do occur. Now that stock-taking is at hand with most concerns, the question crops up : How shall we deal with the plant this year ; shall we allow anything for depreciation—and, if so, how much, and what variation shall we make in the different items ?

We have laid down here two broad divisions which it is well, we think, always to keep clear of each other —fixed plant and loose plant. Some places do not make the distinction. Suppose it is their hose plant that is in question. They have, say, a hose machine and a hose pan and carriage, but these are no use without mandrills, so they argue that the mandrills should go with the other two, and all be considered as hose plant. The effect is, however. that two things get mixed up that should not be— the loose articles which deteriorate quickly, and the fixed machines which lose their value very slowly.

So far, the rubber industry has been rather favoured with regard to depreciation in fixed machinery. In some trades, notably the cotton trade, so great have been the improvements in machinery that places that have only seen ten or fifteen years have had to be all cleared out—the plant could not be run at a profit. The change has been complete ; the new is not simply the new but, in its way, it is the original, the first of its kind. The rubber trade has varied little. A practical man could walk through some rubber works that have been going without a stop for forty years or so and, if he was not told, he might take it for one started only a year or so ago. There have been some improvements, but they have been slight and, indeed, many of them were classed as "fads," with great truth, by a recent writer in this paper. What may be in store for us we know not. In regard to one important branch, the manufacture of rubber shoes, we are promised by the American *India Rubber World* a complete revolution in a very few years. The present method is to be entirely swept away. The statement is backed by the Editor of that paper, a usually clear-headed and well-informed man, but we are still sceptical about it. We do not propose to alter our line in consequence ; and that is, that as regards fixed rubber machinery, a heavy depreciation is not called for. The value goes down only slowly and little. There has been a fair quantity of second-hand machinery sold during this year and some of it had worked a long time, yet we doubt if the bulk did not realise two-thirds of its first cost.

One item that is rather outside proper rubber machinery wants looking at carefully, however, and that is the engines and boilers. If these stand in the books at anything near their first cost they are overvalued. From what we have seen ourselves, good articles of these kinds can now be got much below what they were worth three or four years ago.

There remains the very considerable portion that is known as loose plant to deal with, but our space is exhausted. We can only say that this should be treated very liberally for depreciation if the proprietor desires to feel sure that his balance-sheet is on a sound basis.

RECOVERED RUBBERS.—The science of recovered rubber does not simply end when it has been freed from sulphur and extraneous matter. The purest recovered rubber may often be the worst from the manufacturing point of view, owing to the treatment which it has received in order to bring it to its high state of purity. In these days of competition there is everything to be said for the use of recovered rubber in the manufacture of a large percentage of the principal articles made. There are several conditions, however, which it is essential should be observed in the recovering of rubbers, and these, while not difficult to define, are very difficult to execute in practice.

First, it is essential that the recovered rubbers should not be adulterated, or loaded in any way, for the manufacturer may be using other fillings incompatible with those in the recovered rubber. He should at least be confident that in using recovered rubber, he is making use of a material which will not interfere in any way with the other ingredients of his mixing.

Secondly, the manufacturer should be acquainted with the percentage of mineral matter present in the recovered rubber which he is using, and, through having information of its specific gravity, should be able to work out beforehand the density of the goods which he wishes to produce.

The Rubber Chemical Co., of Mitcham, Surrey, are of our mind in this matter, and they believe that in working on these lines, they can look with every confidence to satisfactory increase of trade with their customers.

As the real test of a recovered rubber is after all, its satisfactory vulcanisation, they are prepared to supply samples (vulcanised) of their recovered rubbers, and, further to guarantee a uniform quality and a uniform percentage of mineral matter and specific gravity on all orders. This can only be accomplished by carefully handling and grading of all the various rubbers received, and certainly no manufacture can show greater confidence in his efforts in this direction than to guarantee uniformity in every respect. We cordially draw attention to these facts here, because in guarantying uniformity in recovered rubber a step is taken in the right direction of utilising a material in the rubber manufacture whose only fault is a very slight tendency to deteriorate quicker than Para. In any case, such a guarantee of uniformity is sufficient inducement for manufactures to write for circulars, price lists, and samples to the Rubber Chemical Co., Ltd., Mitcham, Surrey. —*India-Rubber and Gutta-Percha Trades' Journal*, Jan. 6.

MALARIAL FEVER AND THE MOSQUITO.

(To the Editor of the *Pioneer.*)

SIR,—The theory that that exasperating insect the mosquito is responsible for the propagation—if not the generation—of malarial fever, is gaining ground so rapidly and widely that one feels backward to impugn it, and still, reading the following unequivocal passage in that delightful book of Du Chaillou's, *The Land of the Long Night*, one cannot help feeling sceptical. He says at page 81 : 'Give me the plateaus of the Arctic regions for health. There are plenty of mosquitoes in summer, but no malaria at any time.' So far as I remember, the fundamental experiment upon which the supporters of the mosquito theory base their belief is that of the two gentlemen who lived under a net in a notoriously malarious district in Italy during the worst time of the year for malaria and escaped being attacked. It is argued the mosquitoes did not get at the experimenters, and they did not suffer from the malaria; *ergo*, the mosquito bite is responsible for the fever. This reasoning is plausible but certainly not conclusive for may not the netting, besides keeping out the mosquitoes have also arrested the germ or atom of malaria from passing through to a degree dependent upon the hygrometric or some other physical condition of the atmosphere ? In support of this view, I would quote the following passage from Dr. Moore's *Family Medicine for India* page 628: 'Sir Emerson Tenent writing of the fever district of Ceylon states that curtains round the bed act as preservatives from disease.' Mr. Du Chaillou's observation quoted above is important, coming as it does from one who has

travelled intelligently in remote and unhealthy regions. I may say that my own experience gained from several years spent in Sindh and Burma, two provinces notorious for malarial fever, does not accord with the mosquito theory—for instance, in the Southern Shan hills between Hlandet and the platcau of Phenlah more especially in the neighbourhood of Singu, the country is deadly during the rains from malarial fever, and yet, during this time it is cool enough to keep ones self covered, and so ward off tho attacks of mosquitoes, and I found the mosquitoes more numerous in these parts before the rains than during the rains the fever season. Again in Sindh the fever season is coincident with the failing of the river, roughly 15th September, and continues to the middle of December, the weather during this timo is cold, and people of course keep themselves covered at night so here the mosquito is not in it. Lastly, Major Waddell, Indian Medical Service, in his excellent work, *In the Himalayas*, makes frequent mention of the deadliness of the valleys in Sikhim from malarial fever, but nowhere is any allusion made to the mosquito in this connection, indeed, it would appear that the doctor did not come across mosquitoes at all!
—*Pioneer*, February 6. T. D. M.

INDIAN TEA MARKETS EXPANSION.

We take the following extracts from the Report of Messrs Andrew Yule and Co., the Commissioners of the Indian Tea Markets Expansion Commission, for the period ending the 31st December, 1901:—

The offer of Messrs. Andrew Yule and Co., to manage the operations of the Commission, was accepted by the Indian Tea Association at a meeting held on the 16th July, 1901. This report, therefore, deals with the work of the Commission for the first five months of its existence.

GRANT-IN-AID.—Grant-in-aid of R40,000 was received from the Indian Tea Association, on the 26th July, 1901, and deposited with the Bank of Calcutta, Ltd. Tea contributions promised to 31st December, 1901, amount to 680,744 lb. Of this quantity 269,395 lb. or about 39 per cent, has been received up to the 31st December, 1901.

PURCHASE OF TEA.—To meet the demand for classes of tea. other than those contributed to the 31st December, 1901, 9,615 lb of tea were purchased at a cost of R4,102-14-2.

TEA IN HYDERABAD.—The Hon'ble Lieutenant-Colonel D W K Barr, C S I, resident at Hyderabad, forwarded the Commissioners' copy of a letter which conveyed the consent of His Highness to the announcement of the Nizam's approval of the scheme for developing the consumption of tea in India, and promising the support and countenance of His Highness to the effort of the Commission to increase the use of tea within the Hyderabad Dominions.

THE POST OFFICE.—The Director-General of Post Offices of India, Mr A V Fanshawe, C S I, sanctioned the Commissioners approaching the extra departmental agents of the Post Office, not being regular servants of Government either as Postmasters or Schoolmasters. A start has been made, and pice packets are now to be procured at 46 extra departmental Post Offices.

THE RAILWAYS.—The Sub-Committee of the Indian Tea Association attached the greatest importance to the supplying of tea to native passengers on the various Railways. It was estimated that there are something like 160 million passengers annually, and an average consumption of only 1 oz of tea per head per annum would absorb 10 million pounds. The Commissioners have approached the principal Railway Companies in India for permission to sell tea at such stations as they might deem most suitable.

PRIZE ESSAY COMPETITION.—With a view to elicit the opinion of the native community the Commissioners offered a prize of R100 for the best essay on "How to bring Indian tea to Indian homes." Seventy-three essays were submitted, of which ten arrived too late, and 20 were disqualified for various reasons. The prize was awarded to Babu Sures Chundra Dutt of Sikarpur Post Office, Nadia, Bengal, who has since been taken on the staff of the Commission.

ONE PICE PRIZE PACKETS.—In order to encourage tea drinking it was arranged to issue from the Head Retail Depôt of the Commission in Calcutta, as from the 2nd September, 1901, one pice packets containing about three-quarters of an ounce of good tea. Each of these packets bears a separate number, and R100 is offered monthly in prizes, *viz.*, one prize of R50, five prizes of R5 and 25 of R1 each. the winning numbers being declared on the 1st of each month. At first the issue was confined to Calcutta, but as the idea caught on, was extended to other places, and daily applications for agencies are now being received from all parts of India.

BREWED TEA IN CALCUTTA.—The supplying of brewed tea entails a small loss to the Commission, but it is a valuable means of introducing the custom of tea drinking among the people, and also of removing the erroneous ideas now largely held by the Hindus as regards the effect of tea on the constitution. The tea is prepared by high caste Brahmins, who have been carefully trained to the work, and the orthodox Hindu can, therefore, drink it with safety. Most of the larger Government and Mercantile offices in Calcutta are now regularly supplied with this tea.

FASHIONABLE NATIVE GATHERINGS.—There are evident signs that tea is being regarded with greater favour by high class Native society in Calcutta. In September last, at a meeting of the leading medical men of this city, brewed tea was, by special request, supplied by the Commissioners, and over 100 cups were taken. Tea has been also supplied to several Indian wedding and social parties.

INDIAN INDUSTRIAL EXHIBITION.—In December last tea was supplied to the Indian National Congress and the Indian Industrial Exhibition, and was much appreciated.

THE STAR THEATRE, CALCUTTA.—Tea is served to the public attending this place of amusement, and a play which is now running there has a tea drinking scene called "The Morning Tea," with verses in praise of tea, which are well received by the audience.

OTHER PLACES OF AMUSEMENT IN CALCUTTA.—Tea was supplied nightly at the Circus tents with satisfactory results, the native patrons of these performances expressing appreciation of this effort to provide for their comfort at a cost within their means. Tea has also been available to the syces and coachmen waiting for their employers at European theatres in town. All round the tea supplied by the Commissioners has been regarded as a boon and a great improvement on that obtainable from the Mahomedan hawkers.

CALCUTTA PORT COMMISSIONERS.—Mr Dumayne, the Vice-Chairman, has kindly issued instructions to officers in charge of the Docks, Jetties and Wharves to afford every facility to the employees of the Commission in the sale of tea to coolies and others frequenting these places.

CALCUTTA STUDENTS.—The Commissioners obtained the sanction of the Principals of the Presidency College and the General Assembly's Institution, Calcutta, to supply tea within the compounds of these institutions, and made a start, the result of which, however, did not come up to expectations.

CALCUTTA MILL HANDS.—To place pure tea at a cheap rate within reach of Mill workers, pice packets are now sold at many of the Jute Mills and other centres of labour.

COLLIERIES.—The pice packets of tea are now being sold in the bazaars of many of the Coal Concerns in Raneegunge and Jherriah Districts, and the quantity taken is encouraging.

MICA WORKERS.—The Commissioners record their thanks to Mr. W D Clyburn, of Bhaghitand Koderma, *via* Giridhih, through whose kind assistance they have been able to place the pice packets within reach of the mica workers of his District

FAIRS AND MELAS.—A start has been made at tea demonstrations at Fairs and Melâs, and Mr. Radhanath Dey, late Agent for General Pudma Jung of Nepaul and who had travelled extensively in different parts of India, has been engaged for this special work. He attended the Sonepore fair and is now at the Khagra Melâ at Kissengunge. Mr. Dey is thoroughly conversant with tea, on which he has written a pamphlet and was awarded a certificate of Honourable Mention for an exhibit of tea in the late Paris Exhibition.

LABOUR DISTRICTS.—Through the courtesy of Mr. Hngh Gordon, the travelling Superintendent of the Tea Districts Labour Supply Association and of Messrs. Begg, Dunlop and Co., the Secretaries, the Commissioners have been allowed to avail of the services of all Agents of the Association, who may care to nndertake the sale of tea. A number of these Agents have consented to assist the Commission in this way.

JUTE DISTRICTS.—Messrs. Sinclair, Murray and Co, of Calcutta, have kindly placed their Agencies at the disposal of the Commission, and their Agents are now being communicated with.

AGENCIES.—The teas of the Commission, either in pice packets or other forms, are now available in 78 towns and villages of India, and fresh agencies are in course of arrangement. At Dacca, the Agent reports doing good work, by means of advertisements, handbills, house-visiting, lectures and distribution of tea. The following is taken from his Reports:—"A smart Dacca born Indian assistant, well acqnainted with the town, formally visits house by house, distributes samples on his first call, and books orders on his renewed visits. The same assistant holds lectures in popular parts of the town, the chauk or market square being the chief one, on the benefits of tea drinking. He emphasises to Hindus that tea is a vegetarian's drink and to Indians in general, and that it is a produce of their mother country. Once weekly the poor assemble, and under circumstances pleasing to themselves, receive brewed tea free. With the beggars come many of the poor but better class, who also receive a cup each free."

SUPPORT.—During the past five months there has been ronghly an expenditure of R10,000, and there is a snbstantial balance in hand. Good work has been pnt in for the ontlay incurred, but the Commission has as yet only touched the fringe of the garment, and as the area of operations extends, the expenditnre mnst be proportionately increased. The Commissioners feel that it wonld be a very great pity if the extension of such operations be retarded by lack of snpport, and for this reason they hope that the undertaking will receive greater support from the Tea Industry generally than has so far been accorded it.—*Madras Mail*, Dec. 12.

PLANTING AND PRODUCE.

The tea trade, while doubting that the Chancellor of the Exchequer will increase the tea duty, seem to think that they mnst be prepared for eventualities. Considerable quantities have lately been clearing from the bonded warehouses. This movement has heen going on since the earlier part of December, and its dimensions have been steadily increasing.

It is consoling to find that one of the largest holders of shares in tea-growing companies, and one of the most energetic and enterprising members of the tea distributing trade, not only has faith in the future of British-grown tea companies, where judiciously managed, but is also of opinion that there will be no increase of duty. Mr J Lane Densham, of the Mazawatte, Tea Company, has wisely issued a circular cautioning grocers against any attempts made to scare buyers into a panic abont an increase of duty. Mr Densham of course, has been active in furthering the movement for placing all the facts about the tea duty before the Chancellor of the Exchequer, and as the managing-director of one of the largest tea distributing firms, as well as a shareholder in abont thirty tea-growing companies, has, we believe, been in correspondence with Sir Michael Hicks-Beach with reference to the position of the industry. Mr Densham recognises fully the blow the industry wonld receive were the dnty increased, bnt he, like other leading men in the tea trade, cannot believe that the Chancellor of the Exchequer will, in the face of the representations of the tea planting commnnities of India and Ceylon, take any steps calcnlated to bring ruin npon producers. This opinion is shared, as we have stated, by other influential men connected with the tea enterprise, but, all the same, every effort will be made to make it clear to the Chancellor of the Exchequer that the matter is one of life or death to the industry.

A correspondent of the "Grocer" contributes his mite towards the solution of the duty question, by giving the Chancellor of the Excheqner a hint to issue licenses to sell tea. These, he thinks, shonld be charged at the rate of two guineas a year. The idea, as stated by the correspondent, is that "The tea trade then would go into its proper channels and the extra trade we shonld do would pay the license. As it is now, anyone and everyone is selling tea. Fruiterers, dairymen, drapers, pnblicans, &c., are all selling tea, and they would be only too glad to drop it rather than pay a license. It would also stop men hawking from door to door—some of them supposed to represent a London honse, but who bny tea done np in quarter-pound plain papers from the first grocer they come to at 1s 2d per lb, and sell it for 2s. These men do the trade a lot of harm." We snppose it is bnt natural that the grocer should regard the sale of tea as coming within his sole right, and that he shonld think those who sell it and are not grocers are merely interlopers. But it mnst be a poor business to the fruiterers, drapers, and the rest engaged in selling tea if a two-guinea license would settle their business.

If the information received from Cape Town be correct, Indian and Ceylon tea growers will have a good opportunity of pushing their tea in South Africa. The Press Association says:—"Information has jnst come to hand from Cape Town that next year will see a British and Colonial exhibition there on a very large scale. It is felt that this would offer a special opportunity for firms in this country and in our colonies to meet in a measure the tremendous competition which must resnlt from the great efforts which the Germans and Americans are already making in anticipation of the large volumes of trade which may be expected as soon as the war is over. The exhibition will, of conrse, be confined to British and colonial traders. The movement has the strong sympathy of very high officials in London and prominent commercial men in different parts of the Empire, and at the right time an effort will be made to secure the support of the Colonial Office."—*H and C Mail*, Jan 31.

THE INDIAN CRYPTOGAMIC BOTANIST.

Dr. Butler, cryptogamic botanist, who came out from home last October, is about to be transferred from the control of the Botanical Department, for work under Mr. Mollison, Director General of Agriculture. This step may be taken as an indication of the desire on the part of the Government that Dr. Butler's services shall be utilised exclusively on economic questions.—*Times of India*, Feb. 10.

"THE PEARL OYSTER, NACRE AND PEARLS."

A FRENCH WORK.

L'Huître Perlière, Nacre et Perles. Par L G Seurat. (" Encyclop. Scient. des Aide-Memoire"). Pp. 194. (Paris : Masson et Cie.) Price 2 fr. 50 c.

This is a useful little book of close on 200 pages and a few illustrations in which the author—whose name was already known in connection with pearl oysters—has brought together the leading facts in regard to the molluscs, of both sea and fresh waters producing pearl and mother-of-pearl. The introduction shows that the book has been written mainly in the interest of the French nacre industries, which the author regards as of great national importance. Although London is at present the great market for pearl shell, we are told that " La France possède, en effet, les plus vastes bancs d'huîtres perlières et nacrières qui soient au Monde, dans ses colonies d'Océanie," and the author evidently desires to stimulate the exploitation and cultivation of the French pearl industries at Tahiti and other Pacific stations. But still, the descriptions of animals and fisheries have been drawn from all parts of the world, and in fact most attention is given to the oyster (*Meleagrina fucata*) of Ceylon and British India on the well-known banks of the Gulf of Manaar.

M Seurat points out on more than one page the gaps in our knowledge of the nacre-forming molluscs, and wisely insists upon the necessity of a thorough examination of the structure, life-history and habits of the Meleagrinas before it is possible to establish a rational regulation of the fisheries. The scope of the work may be gauged by the following summary of the contents of the chapters : Anatomy and biology of the pearl oyster and of other molluscs that produce pearls or nacre ; the pearls, their position, structure, chemical composition and experiments as to their production artificially ; the fisheries both in the sea and also in the rivers of Europe and America; commerce and industries; and finally, pearl-oyster cultivation. In his conclusion our author sums up that " l'ostréiculture perlière est une chose possible, qui est susceptible de donner des résultats partiques," and draws a rosy picture of the prosperity that would attend the lagoons of Tahiti under a rational exploitation of this new industry. So may it be.—*Nature*, Jan. 23.

THE RUBBER MARKET AND PROSPECTS.

(*Krarich's Annual Review for 1901.*)

During 1901 the rubber market has not been characterised by heavy or exceptional fluctuations ; it was again not a particularly satistactory one for holders and importers of the leading grades, and although trade remained exceedingly active throughout the year, the values of all grades of rubber at the close are less than a year ago, and fine para shows a further recession of 3d per lb,and other grades in proportion. The bulk of the stocks of Mediums have gradually been exhausted, although it must be admitted that the prices realised were exceptionally low, and showed an enormous loss to the importers or holders, and even the more recent imports were disposed of at prices realised show a considerable loss. The imports of important Medium grades have fallen off considerably, and as the enquiry has increased for same, we do not anticipate a further appreciable decline in values, and one ought certainly to advocate the encouragement of a substantial increase in the imports.

As regards the quality of Para rubber, considerable grievance was again caused by the want of care in the proper selection of these grades, especially from the Island districts, and this has led to numerous disputes amongst contracting parties. Trade in Great Britain and with leading Continental rubber works was fairly good and the stocks of raw material at the factories is not large, and in spite of the fact that deliveries have been exceptionally heavy, the reported consumption of fine Para exceeds that of previous years. The American market showed the position there not to be so strong except for the first few months, but, generally speaking, the rubber trade has been busy, and the only important speculative stocks are held by one leading American house, whose position at the close of the year was considered very precarious. Visible supply now of Para and Peruvian is 4,618 tons, against 4,100 tons last year. This includes America, with a stock of 2,005 tons, against 1,200 tons last year.

Should the demand for Para rubber continue good, the statistical position at the end of 1901 is certainly a very healthy one. The total for the year's crop (from July 1st to December 31st) amounts to 13,680 tons ; this means an increase of 2,400 tons, while against this total increase of the visible supply gives us only about 480 tons. Thus about 1,920 more tons have gone into consumption ; this despite the fact that it is well known that the "invisible" supply is exceptionally small. Although grave financial difficulties were experienced by many holders of rubber, the position of the rubber market is fairly sound, and with constantly increasing consumption, rubber must be considered very reasonable at present quotations.

PARA KINDS.—At the beginning of the year we had to record a brisk enquiry for para grades, and business on a large scale resulted, but, owing to continued " bear" operations, prices quickly exhibited an important recession, and while hard fine Para was quoted at the beginning of January at 3s 10½d, soft at 3s 9d, negroheads, scrappy, at 2s 9½d, Island at 2s 1¾d, Cametas at 2s 4d, Peruvian ball at 2s 7½d, and slab at 2s 2d, prices declined rapidly during the latter portion of the first month, and sales for forward delivery at a marked decline were done on a large scale, with the result that prices for Para grades receded about 3d per lb by the end of the first three months. In America fine Para was then sold as low as 3s 6d, scrappies 2s 6¼, Island 1s 11d, ball 2s 4d, and slab 1s 11d per lb. We then began to receive the first advices from Para of probable short receipts, and some important buyers, partly relying upon these reports, bought large quantities, thereby causing considerable briskness ; this improvement was actively maintained for a few weeks, and as high as 3s 10d to 3s 11d was paid for fine during the middle of April. Other sorts were 2d to 3d per lb dearer. Soon afterwards, however, the market again showed signs of weakness, the demand being somewhat dragging, and in July hard fine was quoted at 3s 8d, soft 3s 6d, but a temporary reaction in August resulted in quotations again reaching 3s 10d to 3s 9d. We have then had irregular declines of 2d per lb, and in November hard fine was as low as 3s 5¾d, 3s 3½d the lowest of the year. Additional cable advices

from Para of probable short receipts during the end of the year and the early months of 1902 brought about some recovery on less pressure to sell, and with very large deliveries and moderate receipts, we close the year firmly with quotations of hard fine at 3s 6¾d, and soft at 3s 5¾d. Negroheads continue to remain very scarce, scrappy being quoted at 2s 9d, Island (of which the greater portion is being shipped to America) 2s 1½d, Cametas 2s 2d, ball 2s 6d, and slab 2s 0½d. The total amount of rubber imported from Brazil shows a further increase of 3,200 tons, and the total quantity exported from the State of Amazonas, including Peruvian, *via* Iquitos and Manaos, is 4,000 tons, against 3,100 tons. The Peruvian fine imported has, we think, been better as a whole; but, owing to the rubber having arrived in most cases uncut and unselected before shipment, new rules had to be adopted in order to provide for this altered mode of shipping this rubber. The Peruvian ball imported has not been up to the expected quality, and at the end of the year the standard of fair average quality was considered lower, although some nice clean hard balls when received did realise fairly good, and, in some cases, exceptional prices. The slab continues to be of good serviceable quality, and the consumption of it is certainly spreading. Bolivian kinds have been very fair, but the imports were not as large as last year. Mollendo again showed a marked improvement in quality, and consequently sold exceedingly well. From Venezuela, *via* Orinoco, the supply was less than last year, and the quality not very attractive.

Imports of Ceara scrap are smaller, but of these grades only the best qualities could be sold easily; others are dragging. Of Menicoba kinds we received less, but quality was good, and prices realised were satisfactory. Pernambuco and Assaree qualities have somewhat improved, but, owing to the general decline of the rubber market, the values of these classes receded considerably. There were not very important arrivals of good Mangabeira, and although the stocks are considerably going down and available supplies very small, the prices realised for ordinary quality show an enormous falling off in price. The imports of Mattogrosso, in sympathy with Para, showed similar fluctuations, although transactions were only spasmodic. Central America has again been conspicuous by a further considerable decline in its export of rubber, probably owing to the continued political unrest existing in those parts, and the only rubber reaching us comes from the Columbia districts, but the quantities were very insignificant. The Equator and Guayaquil kinds sold readily, and the prices at the end of the year are only 1d lower than they were a year ago. Of course, this refers to good qualities only. Inferiors and mixed kinds are much cheaper. The imports from Honduras, Mexico, and Panama were likewise very small.

AFRICANS.—As expected at the close of the previous year, the increase in imports of these descriptions was not only not maintained, but showed a considerable and serious falling off, and we estimate the difference of imports from Africa to be about 2,000 tons below that of last year.

With the exception of slight spurts in April, and again in August (in sympathy with fine Para) the year 1901 has been characterised by an uninterrupted decline in African rubber, the only exception being first Sierra Leone Niggers, which are actually rather dearer than a year ago, while all other descriptions show a decline varying from 1d to as much as 6d per lb.

From Angola received 250 tons less, made up in shipments from Benguela of 1,250 tons, as against 1,500 tons in 1900. Loanda 730 tons, against 678 tons (beside 200 thimbles). Quality has been hardly so good. The Congo has slightly increased, but the quality has seriously declined: about 5,300 tons, against 5,000 tons in 1900. The average price shows a very considerable fall, because so much was of poor quality. The supply from Sierra Leone and French Guinea has again fallen off, partly owing to the prohibition by the French authority of the exportation of the dirty wet and inferior rubber from Conakry. The quality being thus reliable, has caused consumers to look on this kind with favour, and their appreciation is reflected in the price, which is unusually high compared with rubbers, both African and Brazilian.

Quite an extraordinary decline in supply of Gold Coast, Accra, Lagos, etc., and only moderate from Cameroons, Sierra Leone, Gaboon, etc., and small of Senegal. Prices of nice hard only about 2d lower, but soft common and Lagos fully 4d decline for the year. We no longer quote strips and biscuits, the pressing of lump rubbers being practically abandoned. Liverpool imports of West African 4,200 tons, against 5,140 tons in 1900, and 5,600 tons in 1899.

The Congo Free State has again increased its exports to Antwerp, but other kinds of African have gone there in reduced quantities, so that the total Antwerp imports show little change.

During January African rubber met with a disappointing demand at rather easier prices. February and March were very dull, and prices declined for most sorts, closing with lower values all round. In April fairly good trade was done at rather better prices, closing, however, somewhat quieter. A moderately large business was done in May at irregular prices. Good Sierra Leone sorts were then well in demand, showing, however, little, if any, change in price; whilst lump descriptions were ½d to 1d per lb. lower. During June and July African rubbers met with a moderate to poor demand at generally lower rates, and only a comparatively small trade was done at barely steady prices. The demand was better in August, especially for parcels of good quality which arrived from Sierra Leone. This position of the market was not maintained, and we see a constant falling off in the demand, which remained disappointing, with only small business passing at generally lower rates, until the end of November, when quite a steady trade was done at generally unaltered and, in some instances, slightly increased prices. The demand continued to improve during December for all the better grades and rather higher rates were paid all round.

EAST COAST OF AFRICA (ZANZIBAR, ETC.)—The supplies of these descriptions have continued to gradually fall off, and to this must be ascribed the fact that at the close red hard rubber is only 1d per lb. lower, but white and common ball rubber declined about 4d per lb. LAMU BALL (MOMBASSA).—The arrivals were not important, although the quantity was fair, and good clean rubber sold fairly well, prices, however, showing a decline of 2d for the year. Nyssaland sent us some very good rubber, but the consignments were small, and when they reached the market, were brought up readily at fair to full prices. Madagascar supplies

were again on the decrease, and have only been about half of what they were last year, and values were consequently well maintained.

Imports from Ceylon were again insignificant; but, whatever small quantity reached this market, it proved very attractive, as the quality and condition continued to be excellent, and many buyers were anxious to secure even the small arrivals owing to the specially clean condition of this rubber. We confidently expect that if larger imports could be arranged a great circle of consumers would come in and pay full prices for these grades, especially if the quality be kept up. It would be advisable to encourage the planters and others interested in this product in giving particular attention to this most valuable rubber. High prices were realised, and 3s 9¾d was recently paid for fine, and 2s 4d for the Negroheads. It is, of course, known that this rubber should practically be of the same kind as the one coming from the State of Amazones, being grown from Para seed.

RANGOON AND PENANG has also been in much reduced supply. Of the latter description we practically received no further shipments this year; but, in spite of this, all the old stocks held were most difficult of sale, and what was disposed of showed an enormous decline, and thus rubber that was quoted at 3s 2d a little more than a year ago sold at about 2s 2d to 2s 5d per lb according to quality. If good quality of those descriptions could be imported to sell at present rates, it is certainly worth encouraging, as with scarceness of good red Mozambique Ball, the demand for these red Penang kinds would again grow gradually.

Small quantities of Assam were shipped, but the quality was very poor and sandy, and consequently did not meet with any requirement or interest.

BORNEO.—Of this rubber the supplies have not been excessive, but in sympathy with the general tendency of the market prices declined. These grades are still held for higher prices, and with a continuance of the lower quotations all round we must also look for much reduced values in these grades before one will be able to effect larger sales.

PONTIANAK.—Supplies were about the same as those of last year and sold readily, prices showing very little change at the close of the year

Rubber from the French Cochin-China and from Lower China have continued to sell well, the quality and the condition of nearly all arrivals were satisfactory, and the small trade done must have been profitable for the importers.

JAVA rubber and New Guinea have been very scarce but generally speaking these qualities were not in great demand, and quotations were only nominal.—*India Rubber Trades' Journal*, Jan 20.

RUBBER CULTURE IN CEYLON—is spreading steadily. In the Kalutara district the Para plant is nearly universal as a by-product to tea, and now the same is fast becoming true of the Kelani Valley; while a good deal has been done in other districts. This being so, we make no excuse for giving in our daily issue as well as *T. A.* a valuable Annual Review on the Rubber Trade for 1901, from which rubber planters ought to learn a good deal. Ceylon rubber has a full paragraph: "its product being excellent in quality and condition."

E P ORT OF THE PLANTERS' ASSOCIATION "AND THIRTY COMMITTEE."

PLANTED AREA AND TEA CROPS.

We give as usual the main portions of these Reports in a Special Supplement; but in the meantime, we may draw attention to certain salient features in both Reports as they reach our hands today. From the former which is for the year ending 17th February, 1902, we learn that the shortage of crop last year—due partly to finer plucking, but chiefly to unfavourable climatic conditions,—would have been much greater were it not for a large amount of young tea that must have come into bearing during the year. The Committee might have verified this belief, as well as the probable maximum, by reference to the "Handbook and Directory" where the approximate area planted each year is given. For instance here are the figures for area planted for 1896 and onwards:—

Year.	*Total under tea.* Acres.	*Year.*	*Total under tea.*
1896 ...	330,000	1899 ...	378,000
1897 ...	350,000	1900 ...	384,000
1898 ...	364,009	1001 ...	387,000

The 34,000 acres planted between 1896 and 1898 must have told to some extent on the crop of 1901, just as the 14,000 acres additional put in during 1899, should affect the current year's crop; but after that, the additions are insignificant. We are therefore, in Ceylon, very much in the same position as India, where there has been little or no extension of tea since 1898. Only therefore let this present year be "weathered" and the prospect for tea planters should be a good one. Very important, however, is the advice given in the Report before us for attention to "careful medium to fine plucking rather than the manufacture of large quantities of common quality teas," during the present season. The comparative freedom of tea from blight during 1901 and at present is noted. Cacao holds a strong position with low stocks and increasing consumption; but the need of a "cacao-stealing ordinance" is emphasized. A warning note is struck with reference to "cardamoms," the extended planting of which threatens overproduction and unremunerative prices. The unprecedented prices ruling for the products of the coconut palm justify the statement that "the industry is on a very firm footing"—a fact which will no doubt lead to an extension of planting wherever suitable land is available in the Batticaloa and Puttalam districts for instance? There is not much else in the P.A. Report calling for notice; but we are glad to see the reference to the Ceylon Contingent which went to South Africa and that a permanent memorial is to be erected in the Victoria Garden, Kandy.

Turning to the Report of the "Thirty Committee," we find some figures that must be of special interest at this time. The total amount raised by the Tea Cess (Jan. 1895 to 31st Dec. 1901) is R1,768,042; and

of this amount, no less than R1,081,862 has gone to the representative to push Ceylon tea in North America. It may be a question whether all this came from the Cess, as the Report speaks of the expenditure from "1894" onwards. The difference, if any, must be very slight. In 1900 and 1901, Mr. Wm. Mackenzie received R262,561 and up to 31st Dec., 1899, as much as R811,862. Verily, America has had its lion's share and after seven years of expenditure, there is some reason for calling "halt" and giving the Continent of Europe, a full measure of attention.

REPORT FOR 1901 OF THE INDIAN TEA ASSOCIATION.

It is a coincidence that the Report of the General Committee of the above body should come to hand the same day as the local Reports from Kandy. The Indian Report is up to the end of last year. Nothing decisive is mentioned about the Cess Memorial—indeed up to date, we suppose it has not yet gone in to the Viceroy. [Our special message, shows that it is to be presented a week hence. Only one Company so far seems to be going in heartily for making green teas in India —the bonus being fixed at 1½ annas per lb., but the total quantity for the present limited to 200,000 lb. as an experiment. The several schemes for promoting local consumption of tea in India are favourably referred to; and so is Mr. Foley's Mission, the Committee meantime carefully studying the questions raised by it. Indian tea prospects in Central Asia, Russia, etc. are fully considered; and once again it is emphasized that the only alternative to the abolition of import duties on tea in Ceylon and India, will be to equalize them· "the question is still engaging the attention of Government." The Labour Question in many aspects, recceives a good deal of attention in the Report.

THE PLANTERS' ASSOCIATION AND "THIRTY COMMITTEE."

One of the most important results arrived at by the Committee yesterday morning was the Estimate of the Ceylon Tea Exports for the current year, the total being given at 154,000,000 lb. (green tea of course included) against a total of actual shipments of black and green in 1901 of 146,299,018 lb. The distribution compares as follows:—

	Estimated Export for 1902, lb.	Actual Export for 1901. lb.	Increase. lb.
U. K. ...	108,000,000	105,734,570	2,265,430
Anstralia ...	21,500,000	20,641,184	858,816
Russia ...	11,000,000	9,653,896	1,346,104
America ...	6,500,000	4,502,131	1,997,869
China ...	3,500,000	2,694,819	805,181
India ...	2,000,000	1,139,113	860,887
Other Countries..	1,500,000	1,933,305	dec. 433,305
Total ...	154,000,000	146,299,018	inc. 7,700,982

This table enables the reader at a glance to see the out-turn for last year as contrasted with the Committee's anticipations for 1902. Of course "China" is a misnomer, —the teas sent thither (with an insignificant exception) being either intended to be worked up into brick tea for Russia, or for transhipment to the Pacific Coast of America. So again with "India" much of the tea sent through Bombay being intended for the Persian Gulf and other parts outside India proper. The fact that "India" is credited for the present year with so considerable an increase will be certain to attract the attention of planters over the way who complain (and most justifiably) of the Ceylon import duty on tea.

THE INDIAN TEA CROP.

DECREASE IN 1901-2: OVER 12 MILLIONS.

Calcutta, Feb. 19, 8-45 a.m.

The Indian Tea Association has issued the following comparative statement of outturn of crop so far as the returns received for the two seasons 1900 and 1901 respectively:—

	1900—1.	1901—2.
Assam ...	68,708,916	65,203,402 lb.
Cachar ...	27,299,230	23,806,587 lb.
Sylhet ...	34,038,023	29,699,728 lb.
Darjeeling ...	7,738,018	7,323,542 lb.
Terai ...	3,637,688	3,374,985 lb.
Duars ...	30,220,001	30,542,037 lb.
Chittagong	1,065,300	831,020 lb.
Chota Nagpur	185,089	248,187 lb.
Kangra Valley	3,000,000	2,435,405 lb.
Dehra Dun ...	1,785,000	1,798,560 lb.
Total	177,677,257	165,263,453 lb.

The particulars given above are derived from identical sources so far as Assam, Sylhet, Darjeeling, Terai, Duar, Chittagong and Chota Nagpur are concerned, being returns submitted by 28 agency houses, while Kangra Valley and Dehra Dun are furnished by a local Planters' Association.

PLANTING NOTES.

Vanilla from the Colonies.—A decree has been issued fixing at ten thousand kilos the quantity of vanilla produced in French establishments in Oceania (Tahiti and its dependencies), which, from July 1st 1901, to June 30th, 1902, is to be allowed a deduction of fifty per cent of the ordinary import duty on importation into France.—*Chemist and Druggist*, Feb. 1.

Ten Elephants were brought for the Forest Department in ss. "Palamcotta," and were landed at Brooking Street wharf on Wednesday, says the *Rangoon Gazette*, of 7th February. Probably a larger crowd would have attended the disembarkation had it not been for the counter-attraction of the embarkation of troops for South Africa going on at the same time. Many of the animals who seem no worse for their sea voyage walking ashore, but some who were inclined to be unruly were slung and soon realised their absolutely helpless position when in the air. The cost to the Department of these ten animals landed in Rangoon is close on half a lakh of rupees.

Our Pearl Fisheries.—We read in an Indian paper that the Government of India finds that it cannot spare the R.I.M.S. "Investigator," for the use of which the Ceylon Government had applied "to examine the pearl fisheries" here—or banks, rather—till the end of May next.

Tea for Boston: Wakening up.—A Boston corespondent writes on the 15th Jan.:—"In today's *Herald* I saw an advertisement for a *good man* to demonstrate Ceylon Tea." Benighted Boston is evidently going to be enlightened, though it does seem queer, that so late in the day "the hub of the universe" requires the elementary and "first aid demonstration." It should have been past that long ago.

Tea Company Meetings.—Four Tea Company meetings were held in Colombo last month. High Forests declared a final dividend of 2½ per cent making 5 per cent for the year, and the Chairman (Mr. J G Wardrop) in submitting the report dealt with the various points in it showing *inter alia* how the crop had exceeded that of the previous year by 80,000 lb. but that the prices realised were disappointing. It is gratifying to know that satisfactory progress has been made in the matter of securing an outlet road from the estate to the railway. The dividend declared by the Kalutara Company for the year is 2½ per cent and after writing off a large amount for depreciation, a substantial sum is carried forward to the current season's working. Increasing attention is being paid to the cultivation of rubber. The directors of Ruanwella Company have also seriously taken up the question of rubber planting and we trust their experiment will be attended with complete success. The dividend declared today was 3 per cent for the year. Gangawatte Estates Company declared a final dividend of 4 per cent making 7 per cent for the year.

Milk, Coffee, and Cocoa Preparations.—"Zoeco" will soon, we calculate, be permanently engraved on the tablets of the public memory, not only because it is a name which "sticks," but because it is associated with three first-class preparations, viz., "Zoeco" coffee and milk, "Zoeco" chocolate and milk, and "Zoeco" milk proteids with cocoa. We do not name these in this order for any particular reason, as the three constitute a trinity of merit, but speaking of the first, we find it is a preparation, two tea-spoons of which yield with hardly any trouble a fine cup of coffee-*cum*-milk possessing the true flavour of the former. The chocolate and milk combination exhibits nourishing and stimulating materials in a readily assimilable form, and with it, by simple dilution, a refreshing beverage is made. In the milk proteids with cocoa we have the albuminoids of milk declared by scientists to be as nourishing as those of meat, concentrated in natural solution and in a form that affords a quick and nutritive meal. We recognise in the "Zoeco" preparations a superiority in appearance and flavour; we are assured they have a high standard of nutritive value, and that they are permanent even in the hottest climate, and they are put up in neat round tins.—*B. and C. Druggist*, Jan. 24.

Coconut Prices.—Our Veyangoda correspondent writes:—"The coconuts of Dr. William Dias' Yakkale estate in Henaratgoda, are reported to have been sold at R56·25 per 1000. Dr. Dias is the retired Colonial Surgeon of the Southern Province who, since his retirement, has been devoting himself zealously to the improvement of his estates with most gratifying results which have astonished his neighbours." Has the price we have named been beaten this season? Or ever?

The Over-Production of Sugar.—It is not tea alone that is suffering from over-production. Another necessary article of diet, sugar, which has been artificially fostered in some quarters by bounties, is feeling the pressure of an inadequate demand We read that the German Sugar Industry is confronted by a serious crisis, the gravity of which is becoming more and more apparent. According to market experts, the surplus at the end of the sugar year, will be about 2,665,000 tons, against 975,000 tons last year. The same suggestion as was made in regard to tea—the reduction of the acreage by 10 per cent—has been under the consideration of German sugar producers; but it is now felt that the reduction must be by 20 per cent! Meanwhile, as in the case of tea, steps are being taken by the German Sugar Syndicate, to promote consumption, by offering premiums to dealers showing the largest sales, and by allowing special prices to chocolate manufacturers who would bind themselves to use only Syndicate sugar. The similarity in the troubles which tea and sugar have to face, is further disclosed in the enhanced Duty of which both are apprehensive!

Planting in Ceylon.—Mr. C. E. Emerson writes from Deanstone, Rangala, Ceylon, November 11th, 1901 to his old College periodical *Colonia* as follows:—

"Many thanks for the *Colonia*, which I read with great interest, especially the letters from Way, Cartwright and Cettier, and blushed to find that an entire page had been given to my first impressions of Ceylon. No doubt Fairlie has told you that I have secured a billet here in Medemahanewara, rather a lonely district, but a healthy climate and a superb view across the low country to Batticaloa, some 60 miles distant on the east coast. The estate is in tea and cardamoms, 278 acres of the former and about 200 of the latter. Cardamoms, unlike tea, will only grow in certain parts of the island, and in this small valley the majority of the whole crop of the island is cured and bleached. My brother, at the volunteer camp at Urugasmanhandiya, met Thorne, who had just returned from his stay at the College; through him I heard of the death of the Director. I must offer you my sincerest condolences on the loss of one whose memory will always remain in the minds of old *Colonials* as a wise, counselling and sympathetic father of the College. The description in *Colonia* of the river Ore brings back vivid memories of sailing and boating days, of Oxford and Butley creek. I shall always retain a keen interest in the College. *Floreat Colonia.*"

TO THE PLANTING WORLD.

Seeds & Plants of Commercial Products.

Hevea Brasiliensis.—Orders being booked for the coming crop August-September delivery 1902, booking necessary before the end of April, quantities of 100,000 and over at special low rates. Plants available all the year round, 100,000 and over at special low rates. A leading Rubber planter in Sumatra, who purchased 50,000 seeds in 1899, and 100,000 in 1900, writes us, under date 15th November, 1900:—"I received your letter of 20th October, from which I learn that you added another case of 5,000 seeds to replace the loss, &c. I am satisfied hereby, and even after this adding I am satisfied by the whole delivery of this year." Special offer, post free on application.

Castilloa Elastica.—True superior variety cultivated in Mexico, seeds from specially reserved old untapped trees. Orders booked for August-September delivery 1902, immediate booking necessary; large quantities on special terms; Plants in Wardian cases.

A foreign firm of Planters writes under date 11th October, 1901:—"We beg to enquire whether you would procure us 100,000 Castilloa seeds, in which month we might expect them, and what would be the average price." Special offer, post free on application.

Manihot Glaziovii.—Seeds and Plants available all the year round, 100,000 and over at special low rates. A Mexican planter in sending an order for this seed wrote on the 22nd August, 1900:—"If they arrive fresh and germinate easily I may send you larger orders, as they are for high ground where the Castilloa does not thrive."

Ficus Elastica.—Seeds available in May-June; booking necessary before the end of March; also plants.

Mimusops Globosa (Balata) wood of the tree is much sought for buildings, fruits sweet like a plum and eaten, oil from seeds, said to yield as much as 45 lbs. of dry rubber per tree per annum, the milk is drunk and when diluted with water used as cow's milk, grow from sea level up to 2,000 feet, orders being booked for seeds and plants, price on application.

Cinnamomum Zeylanicum (Cinnamon superior variety).—New crop of seed in April to June; booking necessary before the end of February; also plants.

Coffee Arabica, Liberian Hybrid and *Maragogopie* **Hybrid.**—New crop March-April; immediate booking necessary.

A foreign Agricultural Department writes dating 9th September, 1901:—"Please accept our order for 175 lbs. of Tea seed and for 2,000 Coffee beans. In regard to Coffee seed I would say that this will be the first importation made by this department, and we will leave the selection of the varieties to be sent to your judgment."

OUR DESCRIPTIVE PRICE LISTS.

The following six Descriptive Price Lists are now being forwarded with Circulars and special offer of Seeds and Plants of Rubber and other Economic Products:—

1. Tropical Seeds and Plants of Commercial Products, enlarged edition for 1902.
2. Seeds and Plants of Shade, Timber, Wind-Belts, Fuel, and Ornamental Trees, Trees for Roadsides, Parks, Open Spaces, Pasture Lands, Avenues, Hedges, and for planting among crops (Tea, Coffee Cacao, Cardamoms, &c.)
3. Seeds and Plants of Tropical Fruit Trees including Mango grafts.
4. Bulbs, Tubers and Yams.
5. Orchids—Ceylon and Indian.
6. Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons, Roses, Dracinas, Shrubs and Creepers.

Special Arrangements made with foreign Governments, Botanical and Agricultural Departments, Planters and others for supplying seeds and plants of Commercial Products in large quantities.

"SOUTH AFRICA."—The great authority on South African affairs of 25th March, 1899, says:—"An interesting Catalogue reaches us from the East. It is issued by WILLIAM BROTHERS, Tropical Seed Merchants of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbling. We recommend the great Powers and Concessionaries under them to go to William Brothers."

Agents in London:—MESSRS. P. W. WOOLLEY & Co., 90, Lower Thames Street.

Agent in Colombo, Ceylon:—E. B. CREASY, Esq.

Agent in British Central Africa:—T. H. LLOYD, Esq., Blantyre.

Telegraphic Address:
WILLIAM, HENARATGODA, CEYLON.
Liber's, A.I. and A.B.C. Codes used.

J. P WILLIAM & BROTHERS,
Tropical Seed Merchants,
HENARATGODA, CEYLON.

Correspondence.

To the Editor.

THE CULTIVATION AND MANURING OF COCONUTS.

Feb. 11th.

DEAR SIR,—In your issue of the 7th instant your Veyangoda correspondent gives the price of coconuts realised at Yakkala estate, Henaratgoda, the property of Dr. Dias, the retired Colonial Surgeon. Further information regarding this estate will, I think, surprise all interested in coconuts and show to what extent the intelligent cultivation of this palm can increase its yield. The situation of Yakkala estate, I need not say, is by no means the best district for coconuts, and yet its present yield compares most favourably with the best in the land. In 1896 the Doctor took up his residence on the estate and for the first twelve months picked less than 70,000 nuts; previous to this the property was on lease to natives, and within five years he has increased the yield to nigh 300,000 nuts, picked from it in 1901, and this from only four to five thousand trees in bearing or over 60 to 70 nuts per tree. Mr. W B Lamont (who is I am glad to think still amongst us) will, no doubt, be pleased to hear that his words uttered over 30 years ago has been proven, that "no product in Ceylon responds to, or repays so well for manuring as the coconut palm." With this I send you a stalk I took off a coconut tree from this estate, of which the spathe had opened and flowers on the stalks set. You will note the thickness of this stalk and the 11 young nuts on it. This bunch had 36 stalks with two to 11 nuts on each, and there are several such on the tree with nuts similar to this, and I was informed that over 50 trees on the estate are for the first time showing bunches like this, thus promising enormous increase of yield to be gathered during the current year, which the proprietor estimates from four to five hundred thousand. Here then is a nice little sum to work out. What will a 100 acres of coconuts, say with 70 trees to the acre and only 12 spathes per tree per annum (some give sixteen) opening out with 36 stalks and two to 11 nuts on each stalk, of which say only four nuts arrive at maturity (and there are already trees with that number of matured nuts) give per acre? I don't wish to put down the answer on paper for fear the results of its publication may start some blight on the coconut palm. I send you, for the purpose of being better able to follow what I have said, a bunch taken from a native garden on which you will see there are 41 stalks and only 18 of these with one nut on each as you find on ordinary trees. Compare the size of the stalks on this with that on which there are 11 nuts. The proprietor is of opinion that salt especially, mixed with other fertilisers, is the great desideratum and he uses the ordinary culinary salt to the extent of 2 lb. to each tree in spite of its cost, and he is very worth with the Government for not making it more readily available for purposes of agriculture and cultivaon of coconuts in particular. The proprietor says that he is not yet in a position to speak with certainty as to what is the best fertilising mixture for coconuts, but hopes to be able to do so two years hence.—Yours faithfully,

COCONUT PLANTER.

No. II.

Feb. 8th.

SIR,—In the history of the coconut industry have the prices ever reached those ruling at the present time? What is the reason for the present prices? Is it that the demand, by leaps and bounds, outstripped the supply, in spite of the large areas annually coming into bearing in Ceylon and in the Straits, and I suppose in other coconut-producing countries as well? These are a few questions that arise in the minds of coconut planters, and I suppose in the minds of others as well. I have heard it suggested that the war in the Philippines is the chief cause of the rise in the coconut market. I shall feel obliged by your publishing a table showing the areas under coconut cultivation in different parts of the world, with the produce of the trees and the value of the exports. This seems to be a tall order, but for one with an encyclopædic knowledge such as you possess, it will not be so.

Whatever the cause, the fact remains that prices are in the ascendant, much to the benefit of those interested in coconut cultivation. The ruling price of copra at this time last year was R47. I see it announced in the papers that a parcel of copra fetched R66. That means R19 above the market price at this time last year. Of course there is a corresponding rise in the price of nuts.

With the price now ruling for coconuts, coconut estates in the market ought to command encouraging prices. I see a little correspondence in the papers about the price the well-known Kirimetiana estate ought to fetch. As a rule, those wishing to buy a property at an auction sale do not publish to the world the price they are prepared to pay for it.

With regard to your footnote to the first letter of "H. L. D.", R900 per acre is no record price for coconut land in *full bearing*, which has been confounded with "planted land," the words you used. The average price for good land, in full bearing in this District, is R1,000. I have known of land in this neighbourhood selling at R1,250 an acre. For the purposes of a loan, full-bearing coconuts were once valued at the moderate figure of R750 the acre. A European broker in Colombo, who was to make the loan, was dissatisfied with this, and thought it an inflationist valuation, and sent a well-known Colombo V. A., to value the property. He valued it at a higher figure than the local man!

Ten years' purchase for good, bearing land is a safe average valuation. Exceptionally good land might be valued at 12 to 15 years' purchase. But 30 years' purchase is an unheard of valuation, with the published figures, it is utterly impossible to fairly value Kirimetiana. Much more light is wanted.

The price of lands in this District is a splendid advertisement for a Railway. As can be readily understood, with trees bearing so well, and lands yielding such splendid results, affluence is the rule, want and poverty the exception. Money is available for travelling. The more easy and comfortable travelling is made, the more will the people travel. Those not blessed with much property, have remunerative employment afforded them at the two Desiccating Mills. So I see, money is abundant with all classes here. Nobody need want.

MARAWILA.

CHEAP INDIAN ESTATES AND HOW THE PRICE IS EXPLAINED.

Ambegamuwa, Feb. 15.

DEAR SIR,—I see another Indian estate sold for R5,000. We were treated to the same story not long ago, but it transpired afterwards that the same estate had a mortgage behind it close on R200 per acre. Oh! our solvent Indian brothers, is it not time you bucked up and had a Cess at your end and thus relieved us hampered ones from bearing the burden of giving you a fillip, free, *gratis*?—Yours faithfully,

GO SHARES.

TOBACCO GROWING AT JAFFNA.

Colombo, Feb. 15.

DEAR SIR—I have only today seen the *Ceylon Observer* of 8th inst., and therein your article headed "Tobacco-growing in Ceylon and its conditions of success." In it you make out that *I came here* in 1887, whereas I never visited Ceylon till last year. I was asked to come to Ceylon at the time you mention, but could not do so as I was engaged in making experiments in tobacco-growing for H.H. the Rajah of Sarawak. Otherwise, the information given is correct.—I am, dear sir, yours faithfully,

A. MACDOUGALL GIBSON.

[We are glad to find that Mr. MacDougall Gibson takes a favourable view of the native-grown tobacco leaf at Jaffna and feels sure it can be so manufactured under European auspices as to secure a good price in home markets.—ED. *T.A.*]

COCONUT CULTIVATION AND STATISTICS.

Hanwella, Feb. 18.

DEAR SIR,—With reference to your editorial *re* coconut export of 1901, in your issue of the 12th instant, I humbly think your calculation of 500 nuts to a cwt. of oil is too liberal. For I know by experience, that 1½ lb. of good copra produce 1 lb. of oil and ½ lb. of poonac, and an average of 3¼ nuts go to 1½ lb. of copra. Therefore 364 nuts are equal to a cwt. of oil, or say 375 nuts the most.

It has also been found that the average nuts to a cwt. of copra on my estate, for the last three years, to be *235*, but we may allow 250 nuts the most; surely 550 are too high or I should say absurd. [550 was a misprint for 250 and was corrected at once for our weekly issue.—ED. *T.A.*]

I have no knowledge as to the desiccated kernel, but I can say on authority, that the kernel of 2¼ nuts on an average are equal to 1 lb. of dried scrapings used in hand chekkus.

Thus you will see you have been making a very liberal calculation of the out-put of our palm produce.

My calculations, though based on actual facts, may not be quite accurate, but may be acceptable as closer to the mark.—I am, yours faithfully,

CULTIVATOR.

THE COCONUT PUZZLE: LARGE INCREASED LOCAL CONSUMPTION.

Galle, Feb. 20.

DEAR SIR,—With reference to your leader on the "Coconut Puzzle," the slow development of exports is no doubt due to the large local consumption. There is also an increasing demand for *kurumbas* or tender nuts for the sake of the refreshing water, and it is quite apparent that the plucking of a large per centage of these tend to keep down production for export purposes.—Yours truly, A.

P.S.—Some households take six tender nuts per day.

A RECIPE FOR ROSELLE JELLY.

Ythanside, Kotagala, 19th Feb.

SIR,—Having read in today's paper that "Housekeeper" wishes a recipe for "Roselle Jelly," I send my own which I have found very successful.—I am, sir, yours truly,

J. T. S. CAMERON.

"ROSELLE JELLY."

After gathering the fruit wash them and pluck off *only* the fleshy red petals.

Put these in a vessel and just cover with water. Soak for a night and next morning boil till reduced to pulp. Strain in a flannel bag. When all the liquid has run through squeeze the pulp in the bag into another dish and strain again to clarify the squeezed-out juice. Allow 1 lb. sugar to 1 pint juice, put in a copper or enamelled pan, bring to the boil and boil rapidly for five minutes. A soup plateful of fruit and water when boiled turns out fully ½ pint juice.—C.

FARMS IN SOUTH AFRICA.—We have mentioned the settlement on farms first because it is on the agricultural land that the balance in South Africa needs specially to be adjusted, says the *Spectator*. As it was before the war, Englishmen were, roughly, crowded in the towns and their neighbourhood, and the outlying districts were entirely populated by the Dutch. But, of course, there would be among the British settlers not only the men who wanted to become farmers; there would be the representatives of every conceivable trade and calling. And really one does not know of any accomplishment that will come amiss in the settlement of a great country like South Africa. There will be room for tinkers and tailors and candlestick-makers. As for the settlers on the farms, they must not run away with the idea that South Africa is a rich agricultural country. In a general way it is not. A man must not think he can be "a gentleman-farmer," and yet make a good living. He must work himself, and work reasonably hard. But he will have the advantage of being "boss." This may be an advantage in most cases only of form and sentiment, and will mean that the white man is not in competition with the black. This sentiment goes very deep, and cannot be laughed aside. But there is no reason why the white man, so long as his distinction of caste is observed to his own satisfaction, should not wear his pride as easily as the platelayer in India does, who works with, yet controls, his native labourers. There are arbitrary fashions in these matters certainly, but they need not dominate their inventors. An American servant will not black shoes, but he will cheerfully perform the equivalents of shoe-blacking. As for an English ploughman, he would probably rather plough than not. A great deal depends upon the important questions whether or not ploughing is bad form. With common-sense there is no reason why our settlers should nor become as thrifty, and yet as contented, as the small holders in the Eastern States of America, who have deliberately taught themselves to mulate the careful peasants of France and Italy.

THE TEA STANDARD: TRADE MEETING IN MELBOURNE.

A large and representative meeting of the tea trade was held this afternoon, at Messrs. Fraser & Co.'s auction-room, to consider the new standard of tea under the Customs regulations. Mr Charles King, who presided, explained the position under the new regulations, which required not less than 30 per cent. of tea extract, not more than 8 per cent. of ash, and not less than 3 per cent. of soluble ash, as contrasted with the old Victorian Act, under which the decision was left first of all to the expert, who passed the tea on to the analyst. He pointed out that the importers had been taken by surprise in finding teas rejected under regulations in the framing of which they had not been consulted, and while they were at one with the Government and the public in the endeavour to raise the standard, they desired the standard to be a practical and a workable one, that would not cause injustice to any individual. Mr R Ramsay (of Foochow) described to the meeting the method adopted by the United States Government, which annually bought in the market a quantity of tea to serve as a standard, and sold samples to any applicant, in order that buyers might use them as a guide, while in case of rejection three merchants of standing were appointed to give a final decision—a plan that had found to work well. The subject was discussed at length by the meeting, and eleven samples of rejected teas from India, Ceylon, and China, together with the United States standard, were inspected. It was unanimously resolved, on the motion of Mr F G Drake, seconded by Mr E Shelley, "That Messrs. R Ramsay (Fraser, Ramsay, and Company), William Harper (Robert Harper and Company), and Charles King (James Henly and Co.), be appointed a Sub-Committee to consult the tea trade of the Commonwealth, with a view to drawing up a memorial to the Minister of Customs, asking him to alter the regulations under which teas are declared prohibited imports, and also to draw up a joint letter showing the injustice of the present act, as proved by the samples on the table condemned under those regulations, and which, in the opinion of the meeting, representing the tea trade of Melbourne, are sound, merchantable teas, that are fit for consumption, and should be admitted." The Sub-Committee have since drawn up the following letter to the Minister:—

"Melbourne, 25th January, 1902.

"The Commissioner of Customs, Melbourne.

"Sir,—We, the undersigned Committee, appointed at a representative meeting of the tea trade of Melbourne, by whose agency the bulk of the tea brought into Australia is imported, beg respectfully to draw your attention to the disability under which we labour through the new Customs regulations having apparently altered (without due notice being given) the standard under which teas are admitted into the Commonwealth. We most respectfully urge that the importers should have been consulted, and that any change decided upon should have been notified them before such regulations were enforced, seeing that, to the ordinary commercial mind, the description of the standard is meaningless, and that the regulation is one impossible to be understood by merchants at ports of shipment, so that needless and unavoidable loss is thrown upon the merchants here, who are quite innocent and helpless in the matter. Various teas, which the analyst has condemned as unfit for human consumption, have been submitted to our inspection as experts, and, speaking with intimate knowledge of the article, and with an honest desire to prevent teas injurious to public health being imported, we unhesitatingly assert that the said teas cannot reasonably be deemed unfit for human consumption. If such teas can be condemned under the present regulations we asked most earnestly that these regulations be altered in such a manner that commercial men, both here and at the various tea ports may understand exactly what is the standard, below which no teas are to be admitted. It is well known that the English and American systems work with perfect satisfaction, and we would be glad if a similar system could be adopted in the Commonwealth. The American system consists of a commercial standard, samples from each producing country being purchased season by season, by the Government, from whom commercial men can buy samples of same, and an Australian standard on similar lines would entirely meet the views of the trade. We believe any three independent tea men that you may choose in any of the states could safely be associated with your present expert to draw up a reasonable and fair standard recognisable throughout the world.

"We also urge that permission to reship to the original port of shipment all teas refused importation under the present standard be given without delay, so that the loss may be minimised to the importers, who have no possible means of control over the importation, and who are most desirous of complying with the wishes of Parliament, but under the present system are helpless and unable, from causes beyond their control, to arrive at any knowledge of what the standard really is."

Three points are at issue between the tea importers and the Customs department, one as to the particular teas which have just been condemned, another as to the right or otherwise to confiscate or destroy, and the third as to what standard should be adopted for Australia. The grounds on which the teas have been condemned are simply based on the results of a chemical analysis, which is not one universally adopted. The teas themselves are perfectly good, and, indeed, superior to many low-class descriptions that can easily pass the standard. But if they are not to be admitted, then the only course that can be fairly adopted by the department is to allow the importers, if they so desire, to reship the goods. They have been innocently sent and innocently received, and to wantonly confiscate them would be an act of dishonesty.

As regards the general question of the standard to be employed, it is difficult to see how that set forth in the official regulations is to be made workable. The test afforded by the usual process of liquoring and tasting should not be ignored, but doubts have been expressed whether the official test would permit the importation of any China tea—an absurd result, especially as China tea is often held to be the best suited for Australian consumption.—*Melbourne Age*, Jan. 31.

PLANTING AND SOCIAL NOTES FROM MARAWILA.

We have had very welcome rain last week on six days, or rather evenings, which aggregated very nearly two inches. This has been of immense benefit to vegetation, following as it did a drought of nearly a month's duration. Occurring in mid-drought, it has helped to "break the back" of the season of drought, so trying a period to man, animals and vegetation. The face of the country has been rapidly changed from brown to a bright green.

Coconuts are still scarce for desiccating, and the price is in sympathy with that for Copra. It was announced in the papers that the copra of Horekelle estate was sold for the whole year at R60 the candy—a record price. A correspondent of a contemporary of yours announced that merchants were willing and anxious to enter into forward contracts for R64·65 the candy. This was promptly contradicted, and your contemporary called upon his correspondent to name the firms who were so anxious to enter into these contracts. He has observed a very discreet silence, and people form their own opinion for the reason for this gratuitous announcement. I am in a position to state authoritatively however, that a gentleman in this district was asked to enter into a contract for R62 the candy. "Once bitten twice shy," he declined. He hopefully looks forward to copra reaching R100 the candy!

For a decent Circus to visit a wayside village, is an unheard of experience. Duval's Circus was brought to Marawila, by a trio of enterprising Sinhalese, paying the proprietor R1,000 a night, for three nights. The result exceeded expectations. On the last night there was a crowd that could not be accommodated, and those outside became riotous and attempted to rush the tent. The chief headmen being present, the crowd was restrained, with much difficulty and with a promise of another performance. A local syndicate promptly engaged the troup for another three nights on the same terms. The tent had to be enlarged and was filled on these three nights too, people coming from distances of 12 and 15 miles. Doesn't the expenditure of about R10,000 or more, to witness a Circus, bear eloquent testimony to the general wealth of the district as a whole? Isn't this an additional argument for a Railway?

There is a great bustle in Chilaw owing to the approaching visit of the Governor and suite from the Kraal. Preparations are being made for arches, but as the visit is to be on a Sunday, His Excellency may be saved the ordeal of receiving addresses. The offending lamp-post has been removed, and the fate that Chamberlain was threatened with—being hanged on one—has been averted. Possibly no one will be broken on the wheels of tramway too, as the road to the Resthouse will have to be opened for the Governor.

MINOR PRODUCTS REPORT.

London, Feb. 1.

Spices.—Cinnamon chips sold at 2½d to 2⅝d per lb for common quality. Black Pepper was bought in at 5⅝d per lb for light Sarawak, and at the same price for Penang. There has been a large business done in Singapore to arrive down to 6d per lb, but the market has since been firmer with buyers at 6 1-16thd Singapore white was bought in at 10d per lb for dull ordinary, and at 11 to 11¼d per lb for good coriander kind. For arrival fair Singapore is quoted 10⅛d to 10 3-16thd per lb. Penang is unchanged at 9 11-16thd on the spot, and 10d to arrive.

Vanilla.—The supply brought forward on Wednesday was the heaviest on record, and attracted a much larger attendance of buyers than usual. There was a good demand, however, and practically the whole quantity offered, about 2,800 tins, was sold. Long lengths being scarce brought rather dearer prices; medium sold well at late rates, but the lower grades were easier. The auction was adjourned on Wednesday at 5 p.m., and was concluded today. The following were some of the prices paid:—Fair to good chocolate, 8 to 8½ inches, 22s 6d; 7½ to 8 inches, 19s 6d to 21s 6d; 7 to 7½d inches, 14s 6d to 16s 6d; 6½ to 7 inches 10s 6d to 14s 6d; common dry brown 4s to 11s 6d; ordinary foxy to fair short, 5s 6d to 6s 6d; medium, 6s 9d to 7s 6d, and long 7s 6d to 10s 6d per lb.

Messrs Brookes & Green have issued a report on vanilla, in the course of which they state that the Seychelles crop for 1901, shipped from August to December, totalled "fully double" the heaviest quantity exported from the island in any previous season, it being estimated at about eighty tons. The feature of this season's supply of vanilla from Seychelles is the unprecedented large proportion of "short" beans, medium to good size quality measure from 6 inches to 8 inches, but the consignments landed in London during the past three months have contained about 75 per cent of very short beans ranging from three inches to five inches. The result has been that, whilst long-lengths quality has fairly maintained previous values, the short measurements show a reduction of about fifty per cent. To obtain good plump pods, it is incumbent for planters to see that early in the season the young shoots are thinned by pricking out a quantity of surplus sprouts. In the present case it would seem as though nearly all had been allowed to germinate. This view is somewhat confirmed by recent reports from Seychelles, which advise that the flowering for the next crop is small, possibly due to the weakening of the vines last year—indeed, some of the older plants are reported as seriously exhausted, a very natural result if the above surmise is true. During the past year or two there has been an increasing "doubtful trade" carried on by crystallising Tahiti vanilla, and making it in bundles to represent Bourbon and other better-class qualities, buyers paying twice as much as their actual value, or even more.—*Chemist and Druggist.*

JAFFNA AGRICULTURAL OPERATIONS.

The reaping of paddy crops has been commenced throughout the District. In a few villages the crops are scanty, but on the whole the yield of paddy crops is not much below the average. The planting of tobacco is over, though the cultivators met with some difficulty in procuring plants, the nurseries having been washed away by the heavy rains of December and January.—*Hindu Organ*, Feb. 12.

Indian Government Cinchon and Quinine.—The Budget estimates of the Madras Cinchona department for 1902-1903 anticipate a further increase in the demand for quinine, and the estimate of receipts has accordingly been raised to 210,000r, or 19,600r more than the estimate of expenditure for the year. In accordance with a Government order passed on March 10th, 1898, the Government, instead of extending its own plantations and competing with private industry, purchases the surplus bark it requires from cinchona planters at a price per unit which is annually fixed. Provision has been made in the Budget for working up 474,000 pounds of bark during the coming year to meet the increased demand, and for the purchase of two hundred thousand pounds of three and half per cent of bark at 2d per unit.—*Chemist and Druggist*, Jan. 11.

THE ORANGE RIVER COLONY AND LAND SETTLEMENT.

We direct attention to a very interesting communication which we may say, comes to us from an ex-Ceylon planter, and is produced below. As an official in the new Lands Department, our correspondent writes of that with which he is intimately acquainted, and his information ought to be of very great value to any intending settlers in the Orange River division in South Africa. We shall be specially interested from time to time, in learning from the same quarter, how the work of settlement progresses, and of the experience of the pioneers among the farmers. Any one interested can see the copy of the *Bloemfontein Post* with the details of the Land Settlement scheme, at our office.

LAND SETTLEMENT IN ORANGE COLONY.

(*From a Correspondent at the front.*)

Bloemfontein, Orange River Colony, 5th January, 1902.

Since I last wrote you many changes have taken place. Aftera continuous spell of nine months on the trek, first with one column and then with another, I was selected for temporary employment under the Civil Administration as Assistant Secretary to the new Department of "Land Settlement, Orange River Colony." I, therefore, came in from the Jacobsdal, Petersburg District, on 10th October last, and have since been hard at work arranging details and getting the offices started.

THE "LAND SETTLEMENT" DEPARTMENT

is a new one, and their object is to arrange all matters in connection with settling as many men of British descent in South Africa as possible. Lord Milner is very keen on the subject, and so is the Deputy Administrator. As you can imagine the work is of exceptional interest to me. The Secretary is Major K. P. Apthorp, Royal Irish Regiment and at present of the South Africa Constabulary.

His services have been lent the Civil Government by the Constabulary like myself. He is a man of big experience and energy and has thrown himself heartily into the scheme. He is assisted in his work and decisions by a board of advisers chosen from civilians. The work of the Department is increasing rapidly. With the close of the war, however, and the disbandment of the Colonial Irregular forces,

THE WORK WILL SUDDENLY EXPAND TO VERY LARGE PROPORTIONS,

for hundreds of time-expired and discharged men will at once want to start farming and will turn to us for help or advice. We are getting ready for them. All those who desire to remain in the Colony and take up farming are invited to register their names in our books, and to answer a few simple questions. I enclose copy of same which may interest you:—

Questions to be answered by applicants for Grants of Land in the Orange River Colony :—(1) Surname ; (2) Christian Name ; (3) Nationality ; (4) Permanent Address ; (5) Trade or Calling ; (6) Experience as a Farmer ; (7) Available Capital; (8) Farm or Locality Desired ; (9) Married or Single ; (10) Number of Children (if any); (11) Names of two References.

Government who have ample funds at their disposal are

QUIETLY PURCHASING AS MANY GOOD FARMS AS COME INTO THE MARKET,

and the larger ones will presently be subdivided by Government Surveyors to enable each settler to have a supply of water and a sufficiency of land to make a comfortable living for himself and family. Only the best land in good districts is being purchased, so that settlers will have every advantage to start with. Besides these new purchases the Administration will fall heir to over 350,000 acres owned by the old O. V. S. Government. Though nearly all this large area is on lease to Dutchmen, much of it will eventually fall into the hands of this department and be available for settling loyalists upon. The Colony at present is, of course, in much too unsettled a state to allow of any such settlement; but on the other hand there are thousauds of acres of good land, within the protected area, which could be utilised at once for the season's crop. The Land Settlement Department has, therefore, received

PERMISSION TO PLACE A CERTAIN NUMBER OF GOOD MEN

on such places, irrespective of ownership, and let them have the land rent free for one crop. Many time-expired yeomen and others have eagerly availed themselves of this opportunity and in the course of a few weeks we have put out nearly seventy men in small parties who will live and work together and mutually assist in case of an attack.

Government has lent them ploughs and the plough horses ; seed and rations are also given them to be paid for when their crops come in. This, of course, is only a temporary arrangement and is of little interest to the public. The conditions of the Permanent Land Settlement are what the people are waiting to find out, viz: on what terms will Government grant them land. These terms have been carefully thought out and will soon be ready for publication. They are, I think, most favourable. The settler gets his

BLOCK OF LAND RENT FREE FOR THE FIRST YEAR,

after that he gets 25 years to pay up value of his land. The value is fixed on the day he enters into possession, and is unalterable. All improvements are, therefore, his own. Besides paying a 25th part of the price of his farm every year, the settler will also have to pay Government 4 per cent, and if he has insufficient capital to start his farm Government will advance him up to 50 per cent of the value of his holding at 5 per cent. The Government are disinclined to

assist the absolutely penniless man; neither do they want the Capitalist or Land Jobber who can go to the open market and buy what they want. In return for occupying land under this arrangement, the settler will have to hold himself in readiness for service when called upon in defence of his country, and one week per annum must be devoted to training. Government provides a horse, rifle and ammunition.

THE LAND IS INALIENABLE

except with Government consent as long as any indebtedness remains thereon. The settler can, however, pay off all outstandings after three years and become a free man. Such, roughly, are the conditions and to anyone who likes the free open life of the veldt, a home and a competency, I can recommend the scheme as sound. I am sending you a copy of the "Bloemfontein Post" of 31st ultimo which contains as much information about "Land Settlement" as the Administrator cares to make public at present.

PRODUCTS AND MISSIONS IN NEW GUINEA.

During the interview with Bishop Stone Wigg, who was in Colombo this week, and who gave a description of the work,—the work of the Mission stations there, how cannibalism was rampant, the Missionaries' objective, pupil teachers and evangelists, the work and its future, and of New Guinea as a land of plenty—he added :—"The land up in the river districts is rich passing description. There are enormous tracts of country there which will grow anything—sugar, rice, rubber, sago, and, indeed, I don't know what. I have been told that some of the native sugarcane was brought to Queensland some time ago, and proved to be one of the best stocks used on the plantation, but I have not been able to verify that statement. I don't think any sago has, but a great deal of it is made and used by the natives. In fact, there are really no exports at all; and I think this is largely due to the fact that the Australian colonies who had the control of British New Guinea (I mean before the Commonwealth), although willing to pay some £20,000 per annum, did not care to see large tracts of country in New Guinea taken up. I think it was a great mistake to be so afraid that someone would 'make a good thing' out of the country, for there is land enough and to spare. Small blocks for growing rubber or coconut trees would be useless, for the trees do not mature for some four or five years. The export of rubber, if you can dignify it by the title of 'export,' is smaller now than it was four or five years ago, and it is just the same with the beche-de-mer and the pearl fishing."—*Capricornian*, Jan 25.

COCONUT PRICES.—With reference to a recent maximum quotation for nuts which has been the subject of criticism in view of the fact that the Desiccating Mills in the same district were not paying so much, a critic now gives the explanation that evidently "copra driers" can afford to pay higher prices than the "Desiccating Mills;"—that is, probably, for nuts that are specially suited to their particular purpose.

THE CEYLON PROVINCIAL ESTATES COMPANY, LIMITED.

REPORT OF THE DIRECTORS.

The Directors beg to submit their report for the year ended 31st December, 1901, together with a statement of accounts for the same period.

Tho Tea Crop amounted to 485,954 lb, against an estimate of 500,000 lb for the year, and is equal to an average yield of 498 lb per acre from the area in full and partial bearing. In the case of Glassaugh the estimated crop was exceeded by some 1,600 lb, and shortage in the estimate of Brownlow (a matter of between 15,000 and 16,000 lb) is attributable partly to finer plucking, but mainly to unfavourable weather during the last quarter of the year.

The Revenue and Expenditure account shews the year's profit to have been R93,453·67.

The cost of production in 1901 has been 25·02 c. per lb, which includes 1·69 c. spent on manuring, as compared with 24·42 c. and 1·97 c. respectively for Season 1900.

The Crop has sold at an average net price of 44·10 c. per lb, as against 42·56 c. in 1900 and 44·62 c. in 1899.

During the past year the Company's liabilities have been decreased by the payment of a loan of R15,000,000, thus reducing the "Loans on Mortgages" item in the Balance Sheet from R142,473·57 to R127,473·57. R10,000 of this was set aside from the 1900 profits, and the balance of R5,000 was met out of this season's surplus as shewn in the Profit and Loss account.

Including a sum of R7,230·44 carried forward from season 1900, the Profit and Loss Account shews a balance at credit of R54,201·26 after payment of an interim dividend of 3 per cent, interest on Mortgages, Bonuses to Superintendents, and making provision to the extent of R7,500 for depreciations of Buildings and Machinery.

The Directors now recommend the payment of a final dividend of 6 per cent which will absorb R39,960 and make 9 per cent for the twelve months, and that R10,000 be reserved for the purpose of further Mortgage redemptions, the balance remaining after payment of Directors' fees being carried forward to season 1902.

It was considered desirable to add to the rolling and drying plant in the Brownlow Factory, and the outlay in that connection, and on improving the withering arrangements has been added to the Capital cost of Buildings and Machinery. It is not expected that there will be any capital expenditure during season 1902.

The Estimates for the new season point to a yield of 510,000 lb of Tea, costing 24·73 c. per lb, inclusive of an allowance at the rate of 1·90 c. per lb for manure.

The following is a definition of the Company's properties as at the 31st December last.

	Glassaugh. Acres.	Brownlow. Acres.
Tea in full bearing	452	508
,, partial bearing	20	—
,, not in bearing	20	—
Total in Tea	492	508
Fuel trees	9	2
Forest		33
Grass		27
Scrub and Waste	18	20
Total	519	585

Mr F L Clements retires from the Board in terms of the Articles of Association, and is eligible for re-election.

The appointment of an Auditor for 1902 rests with the Meeting.

By order of the Directors.

GEORGE STEUART & Co.,
Agents and Secretaries.

Colombo, 15th Feb., 1902.

THE KNAVESMIRE ESTATES CO., LTD.

The surplus on Revenue and Expenditure account is R27,567·67 to which has to be added the balance (R6508·63) carried forward from season 1900.

The Profit and Loss Account after Providing for Depreciation, Superintendent's Commission, irrecoverable Cost Advances and other outgoings shows a balance of R24,863·66, out of which the Directors propose to pay a dividend of 4 per cent. That will absorb R16,600, and leave, subject to the payment of Directors' fees, a sum of R8,263·66, of which they propose to place R4,614·46 to the Extension account and to carry forward the balance to season 1902.

The Extension account when increased as above will stand at R22,121 18c, which is the difference between the capital of the Company (R415,000) and the amount invested in Landed Property, Buildings and Machnery (R437,121 18c.)

The profit earned represents a return of 6·64 per cent on the capital of the Company, and is equal to R56 72c per acre on the area in bearing, as against 5·90 per cent and R50 40 per acre respectively in 1900.

The total crop secured was 285,953 lb or 14,047 lb below the estimate. The plucking area was 486 acres and the yield per acre 588 lb of made Tea. The total amount of Tea dealt with was 314,401 lb which included 28,448 lb made from bought leaf.

The difference between the 1900 and 1901 crops may be accounted for partly by finer plucking and partly by a bad flushing year as against an exceptionally good one in 1900.

The Tea sold to end of December was 268,653 lb, the nett proceeds of which equalled 29·24c per lb leaving unsold 45,748 lb which has been estimated to 30c per lb.

Including the cost of Tea made from bought leaf, the twelve months' crop was put on the market for 20 68c per lb.

The Company's property on 31st December 1901 consisted of :—

Tea in bearing	.....	486 acres
Tea not bearing	.....	30 do
Jungle ...	.....	73 do
Building and waste land..		5 do
Total	.....	594 acres

The crop expected in 1902 is 300,000 lb. and the estimated cost is 20·60 cents inclusive of capital outlay.

Plumbago mining was stopped on 24th May last, the Syndicate which leased the mining rights having decided to give the work up, and no one has since come forward to carry it on. Cwt 440 were shipped to London by the Syndicate, but the consignments have not yet been realized, and the company has not received its share of the proceeds.

In terms of the Articles of Association Mr Dupuis retires from the office of Director, and is eligible for re-election.

The appointment of an Auditor for 1902 rests with the Meeting.

THE TONACOMBE ESTATES COMPANY OF CEYLON, (LTD.)

THE REPORT.

ACREAGE

The acreage of the Company's Estates is as follows :—

Tea in bearing ...	582 acres		
Tea not in bearing	8 ,,		
Tea seed bearers	3 ,,		
		593	acres
Cardamoms in bearing	..	98	,,
Reserve Forest	..	24	,,
Fuel trees	..	20	,,
Chena and Patana	..	1,142	,,
	Total	1,877	acres

The total quantity of tea secured during the season was 224,133 lb. being 5,867 lb. short of the Estimate. This is mainly due to finer plucking and in its turn accounts for the somewhat increased cost of production *i.e.*, 26·50 cents per lb. as compared with 24·98 cents per lb. last season. The price realised was 37·84 cents per lb. net as against 38·01 cents per lb. last year.

The total Cardamom crop was 9,587 lb. which realised R1·48 per lb. net as against R1·70 per lb. last year.

The total expenditure amounted to R68,577·01. No outlay whatever was incurred on Capital Account.

The Balance available, after providing for depreciation, including R7,555·37 brought forward from last Season's Account, amounts to R29,309.74, and the Directors propose to pay a dividend for the year at the rate of 5 per cent on the paid up Capital of the Company absorbing R14,000, to write off the balance standing to the debit of Machinery Account R2,3 5·36, to place R8,000 to credit of Buildings Account and to carry forward R5,004·38.

The Directors have pleasure in stating that the Debenture Debt has been further reduced by £1,500 during the year, leaving the amount now outstanding under this head at £3,500.

The Coast Advances have been slightly increased during the year under review, from Rs 2,955·16 on 31st December, 1900, to Rs 3,319·78 on 31st December, 1901.

The Crops for 1902 are estimated at 230,000 lbs Tea, 8,000 lbs Cardamoms against an expenditure of Rs 68,799 20.

Mr H Cumberbatch resigned his seat on the Board on leaving the Island, and Mr R S Templer was appointed to fill the vacancy.

Of the Directors the Hon Mr W H Figg retires by rotation but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the Meeting.

THE TRAVANCORE CARDAMOMS ESTATES COMPANY (LIMITED.)

A trading corporation under the above name has been formed, with Mr S Iyer, ex-Dewan, as President, Mr E R Iyer as Vice-President, Mr A V Iyer as Secretary. The capital at present is 22,0 0r., consisting of 200 shares, and the area taken up for cultivation is 290 acres.—*Chemist and Druggist*, Feb. 1.

INDIAN PATENTS.—No. 493.—Horace Drummond Deane, tea planter, of Stagbrook tea estate, Peermaad, Travancore, and Charles George Landseer Judge, journalist, of 47, Free School street, and No. 5-1, Council House street, in the town of Calcutta, both in British India. A centrifugal drier for steamed tea leaf.—*Indian and Eastern Engineer*, Feb.

RUBBER PLANTING.—Ceylon Planters, in the few suitable districts, are awakening more and more to the fact that by the adoption of rubber-planting they can considerably augment the value of products of their estates. The Knavesmire Company at its annual meeting today, on the motion of Mr Denison, gave a mandate to its Directorate to proceed with the planting of rubber at their own discretion. Already some three or four thousand plants are flourishing on the estates of the Company, and we trust that ere long many of our planters may find in this new venture a valuable and remunerative product.

UVA DISTRICT REVISITED.

AFTER AN INTERVAL OF TWENTY YEARS.

(*By an old Planting Correspondent.*)
(*Concluded from page 462.*)

The Park Group including Melrose and Parsloes is scattered over one thousand and twenty acres of land under the management of Mr. Fred. Hall for Messrs. B. Fanshawe and J. C. Lawrie. The fields of tea look well and give a good yield per acre and the transport of tea is easy from the factory located by the cart road to Batticaloa. There are two hundred and sixty-nine acres of tea in bearing on The Park and a good show of timber trees—especially around the bungalow where nearly every Ceylon fruit tree is thriving, including fine mangoes and Australian guavas. Kew pines are doing well in large numbers, and hedges of Madras thorn extend to the cart road. There is a great number of rubber trees in various stages of growth and some fine old jak or *artocarpus integrifolia* and breadfruit. The fields on the Park are in places rather hilly and not exactly park-like though surrounded by extensive grazing grounds or patanas, and it is very difficult to keep stray cattle and buffaloes out of the tea fields. Cattle and goats from the cart road are a great nuisance on this estate as the Superintendent, Mr. Fred. Hall, well knows. Leaving The Park early one fine morning and walking to the top of the hill, we descended into quite a new region or into a deep valley between Lunugala and Bibile with the hill of Monaragala on the right. This is a place few Ceylon planters have seen, and is called

COCOAWATTE

opened up by Mr. Philby some years ago in cacao, rubber and tea. There are no less than 45 zigzags from the ridge to the factory, the bungalow being at about the 42nd zigzag. We were agreeably surprised to see a very fine field of about 100 acres of tea, much better than we expected to see in this hot valley. Mr. Worth was good enough to show me round the Southern end fields of Cocoawatte. Birkin and Pallikerewe comprise 662 acres, of which 250 are under tea with a large area of rubber trees growing very well and seeding freely. If transport was not so difficult, this estate called Cocoawatte might become a very valuable property; as it is, improvements in cultivation and some new machinery in the factory will, no doubt, be money well spent by the present proprietors. The scenery around is wild and picturesque. Returning the same way by the cork-screw paths to the ridge, and after a pleasant walk in the early morning along the lower ridge of a patana, we entered a very fine tea property called Deysbrook of 250 acres of tea, worked with Kehelwatte (Clifton) of 342 acres. Some of the tea fields here give a good yield of tea; for instance, the bungalow field, 30 acres, gives 800 lb. of made tea to the acre and the top field 700 lb. The large river is now spanned by a very fine substantial covered bridge, and the factory is an imposing building, with machinery, the best and latest improved, worked by a turbine. Patent fans to hasten the withering of the green leaf were working. Mr. John Darley would be very much surprised if he saw his old place transformed into so fine a property. We believe J. D.* with his brother-in-law, Mr. Duncan, are doing well in New Zealand. Hopton including Bollagalla or Letchimee Totum is a fine estate with beautiful shade trees along the cart road and scattered over the tea fields; we did not call at the two bungalows or at the fine large factory below the cart road (four stories high). We also passed old Yapame, 460 acres in extent with 211 acres under tea, the property of Mrs. Isham. Hopton continues its tea fields below the Lunugala cart road. The extent of Hopton is some 776 acres with about 400 under tea. The next group is the property of Messrs. W. Stewart Taylor, G. W. Suhren and M. Bremer—total acreage 1,793 with 506 cultivated and 500 under tea.

Mr. W. S. Taylor is managing

GONAKELLE GROUP

including Passara estate and Mortlake: total 1,752 acres—1,036 cultivated with 847 acres of tea, 31 coffee and 158 timber and grass. The Gonakelle bungalow is a perfect museum of hunting trophies—elephants' heads, feet, trunk, tusks, &c., and elk horns—mostly the trophies of Mr. J.J. Robinson now on leave and expected back to Ceylon in June or July next. The beautifully kept lawn, with a piece of ornamental water surrounded by ferns with a small fountain in the centre rockery, is very pretty and two whistling teal swim round and shelter themselves under the foliage planted round the banks. There is a dense shade of *albizzia moluccana* round the lawn and below the bungalow and a flag-staff.

We omitted to mention from Madulsima and Hewa Eliya (or Badulla North) "Swinton" with 220 total acres (tea 163) the property of Mrs. Shephard and Mr. L B Moss; the El Teb Group of 1,724 acres, 600 cultivated including 537 under tea, 63 timber and grass, the property of Captain E H H Gordon—my old place, Deyanawatte, of 167 acres included.

We returned to

DAMMERIA GROUP

including Mahatenne, Vellongalla and Tillycairn, 1,190 total: 659 acres cultivated, with 604 acres of tea, 30 acres cacao and 25 acres of timber. Mr. J B Cotton has managed these places for a quarter of a century; he is still strong and active and we hope good for another long spell of hard work. The bungalow is large and wel-situated, commanding a fine view of the low-country and there is a croquet ground and tennis court—every comfort, but rather warm.

Our mind was made up to pay a visit to Monaragala or Peacock-Rock, and we have done it, and walked fifty miles there and back exclusive of rambles on the hill when

* Is this not the Mr. Darley, who is in Mexico and sends us occasional reports on cacao and rubber? —ED. *T.A.*

there. It was 25 miles by the mile-posts including one mile through Passara and 2½ miles to Dammeria on our return. The conclusion will be on Monaragala and its many unbridged rivers between Passara and the "Peacock Rock"—or the hill so little known by even old planters, situated on the outskirts of the Uva Province and only a day's journey across country to Hambantota, called Monaragala.

MONARAGALA.

Let us review

THE JOURNEY

to this outlandish planting "district." We start from Dammeria estate and walk to the old military station called Aliput, from thence to Budugama and pull up at a resthouse at Nakali. Here we change our wet clothes and refresh the inner man, and rest our weary bones. But what rivers to cross, up to the waist—the Nakali River in particular! The rains had commenced and the rivers were only just fordable. Arriving at Mupane bazaar we discharged the Sinhalese man engaged at Nakali resthouse and obtained a cooly to carry box and guide to Normandy estate. Of course, he took the wrong road, giving a walk of three miles extra, because we were very tired and axious to get on dry clothing. We therefore, ascended Monarakele estate, 447 acres with 247 acres under cacao, managed by Mr. Stephen Sparkes. A long pull and a strong pull brought us to the ridge, and we were glad to enter Normandy estate, 231 acres in extent with 120 acres of cacao, also under the management of Mr. Stephen Sparkes. A change of clothing and a hot cup of tea soon made us forget all the troubles of the day, and, save that a very cold North-East wind was blowing we felt comparatively comfortable, located in a basin on one of the ranges surrounded by great big boulders—enough of them to build another break water. We had often been informed there were a few small pebbles to be found at Monaragala. Christmas came and went and with Mr. L. who was invited over by my hospitable host, we passed a pleasant time and visited Sirigalla next day. This estate, the property of Mr. H Atkinson, possesses 181 acres of cacao, and there is another place just by, called Tring of 151 acres out of cultivation. There is some very fine

CACAO

to be seen both on Normandy and Sirigalla estates—in fact the largest trees I have ever seen whether in Ceylon or in Trinidad or Grenada in the West Indies. One large tree had over fifty pods on one branch and it is common at Monaragala—that is on Normandy and Sirigalla—to count 150 on one tree. Caracas is the name given to the red pod trees which I thought we called Trinidad, and Forastero (hybrid mixed) is the name given to what I thought was Caracas: both kinds bear heavily and very fine large pods. The cacao is shaded by rubber trees, dadap, kola-nut, nutmegs, annato jak and albizzia moluccana which by-the-bye grows at Monaragala to an enormous size—even to sixteen feet in circumference. The dadap had been bark-ringed in some places and came down smash with very little notice in one instance. A tremendous big one measured its length on the ground parallel with us as we walked along the path at Sirigalla and made us jump with the sudden shock. The strong N-E. monsoon blowing laid low many trees; in fact, it was quite dangerous to walk underneath them.

We could see a "dagoba," on the rock to the left of Sirigalla and steps cut in the rock leading up to the "dagoba." We are informed that there is a Buddhist college and a temple where the priest keeps school, but there are not many students.

Monaragala possesses some ten properties comprising about 2,103 acres distributed as follows:—

1,527	acres	under	Cacao.
297	do	do	Tea.
99	do	do	Coffee.
20	do	do	Cardamoms.
1,943			
57	Nutmegs, Kola-nut and Annatto,		
2,000			
103	Para and Ceara Rubber, &c.		
2,103	With shade trees of all kinds.		

Alliawatte with	230 acres of	Cacao	
Moonerakelle do	247	do	do.
Normandy do	120	do	do.
	597		

(Managed by Stephen-Sparkes.)

	acres.
Then come Kumbukkan ...	125
Kumaradola Cacao	258
Moragalla do	181
	565
(Managed by Mr. Betts)	
Raxawa also managed by Mr. Betts	80
	645

Some alterations have been made since I visited Monaragala—particulars of which perhaps have been sent to you. Sirigalla is in charge of Mr. Liesching. Walton is managed by Mr. Austin who looks after the factory at Mupane. Before leaving Monaragalla we must pay tribute to the memory of Eastwood and John Reid who were numbered amongst the pioneers. Leaving Monaragala and Passara *via* Khyber Pass—Gourakelle—back of Namunukula *via* Ravenswood, Newburgh, Ella to Bandarawela Hotel for a rest and evening train to Nanuoya where we spent the night. New Year's Day was agreeably spent in the company of Messrs. George Thomson Vicaresso and Bisset. We wish all prosperity to our friends in the Province of Uva and thank them again for their hospitality.

H. COTTAM.

OVER-PRODUCTION AND CARDAMOM CULTIVATION.—We are asked in a letter from a Northern planting district to put in a strong word of warning about the danger of over-production of cardamoms from the too rapid extension of clearings of this spice. —"Wherever you turn, new clearings are seen to be in progress—not in one district; but wherever there are trees to fell." We sincerely trust that planters will be taught caution by past experience in cinchona and now in tea.

NUWARA ELIYA DISTRICT PLANTERS' ASSOCIATION.

ANNUAL REPORT.

THE PAST YEAR has not been an eventful one as far as this Association is concerned, and consequently it has not been necessary to call many meetings.

THE NUMBER OF MEMBERS who have paid subscriptions individually or on account of estates is 18. It is to be regret'ed that one estate has withdrawn its support, but another has joined which leaves the numbers the same as last year.

THE ANNUAL OFFICIAL ESTIMATED TEA CROP for 1902 is as follows:—

	Estates.	Total Acreage.	Bearing Acreage.	Crop.
Nuwara Eliya Ramboda ...	26	6,696	6,569	3,065,000
New Galway Kandapola ...	the yield being at the rate of 466 lb. per acre.			

THE SEASON for the district generally has been a bad one both as regards crop and prices. A good many estates were short of their estimates for the year, due no doubt partly to finer plucking, but mainly to the less favourable weather which prevailed throughout the year. Prices for high-grown teas have suffered a set back. and have not participated in the market average of the past 6 months.

TATAPARAI COOLY DEPOT AND REGISTRATION SCHEME which was inaugurated by Government is now complete, and your Committee trusts that Superintendents will give it a fair trial, as it promises to be of great service both to the coolies and the planting community. The hearty thanks of the latter are due to the Hon. Mr. Ellis for the trouble he had taken in the matter.

COOLIES have been sufficient for requirements and their health has been satisfactory. This district does not seem to have suffered to any great extent from bolting coolies, but it is considered desirable that steps should be taken to prevent the evil which certainly does exist, and this Association awaits with interest the recommendation of the sub-Committee appointed by the Parent Association. Advances stand at about the same figure as last year. The price of rice continues rather high.

The construction of the Nanuoya-Udapussellawa Light Railway is progressing on the Nanuoya-Nuwara Eliya section, and in parts the sleepers and rails have been laid. A certain amount of masonry and earth cutting has been done along the Kandapola plains. As the railway runs parallel to and crosses the road many times, it is hoped that adequate protection to prevent accidents will be afforded to those who have to use the road for riding and driving.

PLANTERS' BENEVOLENT FUND.—Your Committee would draw your attention to the useful work done by this fund and urge all members of this Association who are not already subscribers to become so.

OBITUARY.—Your Committee with regret have to record the death of Mr J B S D'Aguilar, a member of this Association.

The Finances are satisfactory and show a credit balance of R85·76 against a balance last year of R68·01.

COLOMBO TEA TRADERS' ASSOCIATION.

ANNUAL REPORT.

The following is the annual report of this Association:—

Your Committee have now the pleasure to present their Report for the year ended December 31st, 1901.

TEA SALES.—Owing to the growth of Catalogues, it was resolved at the last General Meeting that Auctions should commence at 11 a.m. instead of 11-30, as in the past. This rule has since been adhered to.

CONDITIONS OF SALE.—For the same reason, viz., the increasing number of lots offered for local sale, a new Rule was adopted, whereby the limit for "Large Breaks" was fixed at 1,000 lb instead of the 700 lb formerly recognised as constituting a "large" break. This arrangement, though at first criticized, has greatly facilitated the work of the Selling Broker, and sales usually finish in reasonable time.

(2.) An alteration was made in Rule 1, which now reads—"The highest bidder to be the purchaser, and any dispute that may arise to be settled by the Selling Broker who is not to declare the name of the buyer until after the lot is knocked down, unless in his opinion there may be any uncertainity as to the bidder."

(3) Rule 7 also was altered to read as follows:—"No teas shall be catalogued until they have arrived, and all catalogues shall be closed by 4 p.m. on Friday. Samples and Catalogues to be delivered by 10 a.m. on Monday for the following Wednesday's sale."

TEA PACKAGES.—The recommendation of the Special Sub-Committee appointed to report on this subject was adopted at an Extraordinary General Meeting, and it is now a Rule that all teas offered for local sale, packed in "patent" or "metal" packages, —*i.e.*, packages other than ordinary wooden packages with 4 oz lead lining—must be so declared by the Selling Broker in his Catalogue or previously to his putting the lot up for sale. It was thought inadvisable to attempt to discriminate further between the various descriptions of packages offered.

AUSTRALIAN IMPORT DUTY ON TEA.—In October last, the Tea Trade experienced considerable alarm owing to the reported intention of the New Federal Government of Australia to impose a uniform tax upon Teas, whether Ceylon, Indian, Japan or China, of 2*d* per lb plus 20 per cent *ad valorem*. The prospective damage to all British-grown teas and the corresponding advantage to Chinas and Japans were immediately recognised, and the Chamber of Commerce took vigorous measures, both by communicating with the Indian Tea Association and making urgent representations to the Ceylon Government, to obtain a reconsideration of the matter from the Australian Government. Thanks to the energy of all concerned, and especially to the prompt action of His Excellency the Governor (to whom this Association hereby acknowledges its indebtedness), in cabling to Lord Hopetoun, the Federal Government have amended their tarriff to a uniform duty of 3*d* per lb on all imported teas. The further tax of 1*d* per lb upon teas packeted out of Australia remains a fact, and it was considered inadvisable to call in question the imposition of this protective measure.

GREEN TEAS.—During the year prospects from America and Canada have been more encouraging to growers, and with experience in manufature coupled with more knowledge of the most saleable article, this new branch of the tea industry may become an important factor in Ceylon's exports. There is no doubt that Ceylons are gradually gaining favour in green-tea-drinking countries, which fact it is hoped may later on help to decrease excessive exports of black teas and thus help to relieve our regular markets of over-supply.

The total exports for the year were, as per Chamber of Commerce returns:—

	1901.	1900.
United Kingdom ..	105,734,570 ..	113,760,193
Australia ...	20,641,184 ..	17,606,912
Russia ..	9,653,896 ..	8,917,185
America ..	4,502,331 ..	3,980,680
Other Countries ..	5,767,237 ..	4,166,669
Totals...	146,299,018	148,431,639

Totals for 1899 and 1898:—1899—129,894,156 and 1898—119,769,071.

The following figures show the quantity offered locally in public sale for the last four years, with the average prices obtained for complete invoices sold:—

1898	..	35,958,819 lb	..	Average 35	cents.
1899	..	38,377,318 „	..	„ 38	„
1900	..	47,681,826 „	..	„ 34	„
1901	..	51,044,000 „	..	„ 33	„

The following formed the Committee for 1901:—

THE CHAIRMAN OF THE CHAMBER OF COMMERCE (*ex officio*).

BUYERS:—Messrs Crosfield, Lampard & Co, Tarrant, Henderson & Co, Finlay, Muir & Co and F F Street Esq.

SELLERS:—Messrs Whittall & Co, J M Robertson & Co, Geo. Steuart & Co., and Bosanquet & Co.

The number of members belonging to the Association is 45, against 42 in the previous year.

The accounts for the past year made up to 31st December, 1901, and submitted to you duly audited, shew a credit balance of R1,396·34.

LIST OF MEMBERS.

Messrs Aitken. Spence & Co, Baker & Hall, Bathgate, Pim & Co, E Benham and Co, Bois Bros. & Co, Bosanquet & Co, Carson & Co, Crossfield, Lampard & Co, Colombo Commercial Co, Ltd, Hon J N Campbell, Darley, Butler & Co, Delmege Forsyth & Co, Delmege, Reid & Co, C H De Soysa Esq, Dodwell & Co, Finlay, Muir & Co, Forbes & Walker, Framjee Bhikajee & Co, Galaha Ceylon Tea Estates & Agency Company, Ltd, Gordon, Frazer & Co, E John & Co, Leechman & Co, Lee Hedges & Co, Lipton Ltd, Lewis Brown & Co, Mackwood & Co, McIntyre Bros, Murdoch & Branwell, Odell & Co, J M Robertson & Co, Rodewald & Heath, Rowley & Davies, Geo. Steuart & Co, Schulze Bros. & Co,, Somerville & Co., Skrine & Co, Stcherbatchoff Tchkoff & Co, F F Street Esq and Tarrant, Henderson & Co.

The Trading Co, (successor to "AG A Koosnetzoff & Co") Messrs Tokmakoff, Molotkoff & Co, Turner, Edgar, Esq, J H Vavasseur & Co, E & H A Webb and Whittall & Co.

ACCOUNTS.

Dec. 31, 1901.—To Advertising R392·86, Printing 34·75, Clerk's Bonus R50, Sundries R3·96, Balance carried down with Bank of Madras R1,396 34.—R1,877·61.

Jan. 1, 1901.—By Balance R1,387·61; Dec. 31 Members' Subscriptions R450, Entrance Fees for Membership R40, R490;—R1,877·61. By Balance brought down R1,396·34.

Colombo, 12th February, 1902.

TEA IN AUSTRALIA.

Everyone drinks tea. Indeed the tea-drinking capacity of Australians has almost passed into a proverb. It becomes therefore a matter of very wide-reaching importance in a community so constant in appreciation of "the cup that cheers and not inebriates" that adequate precaution should be taken to protect us from the danger of inferior brews. There is reason to believe that for some years the quality of our tea imports has been declining. In the desire to meet the demand for cheapness importers have been sacrificing quality to price, and among recent shipments there have been some which have been declared "unfit for human consumption." China and India have been sending us their trash, and it is high time that a stringent check should be imposed upon this method of slow poisoning. Public opinion will support the Custom House officials in their endeavour to raise the standard of teas imported into the Commonwealth. Importers, however, are dissatisfied with the process of judgment. A chemical standard has now been adopted and tea which fails to come up to the mark is liable to be destroyed. Firms in the trade complain that the analytical test is not in accordance with expert conclusions and that the teas have been condemned which cannot reasonably be deemed unfit for human consumption. They think it still harder that no opportunity should have been given to communicate with the shippers, and that they should not be allowed to re-ship the teas and try the chances of other countries where the standard of purity is less severe. There is a variance of standard, for in England teas have been accepted which have been condemned in the United States. It has also happened that a big line of tea rejected by the Melbourne authorities as unfit for consumption has been sold in London, and declared by customs officials there to be perfectly wholesome. There is no reason why equitable consideration should not be given to these representations. As long as the community is protected from bad tea mercantile requirements ought to be studied. Another matter to which some attention might be given is the manner in which consumers are cheated by tricks of the trade. Teas are being sold in fancy wrappers at short weight, and sellers are not always superior to the meanness of weighing in the paper when they sell over the counter. A person who buys a pound of tea is entitled to get a pound of tea, and those who by devious methods rob him of an ounce or so in the pound are practically guilty of fraud.—*Australian Paper.*

THE NILGIRI GAME ASSOCIATION.

OOTACAMUND, Feb. 23.—On Thursday, the annual general meeting of the Nilgiri Game and Fish Preservation Association took place at "Primrose House." Besides the President (Collector) and Hony. Secretary (the District Forest Officer), only seven members were present.

The Association considers that game on the Nilgiris has increased owing to measures adopted to protect it; (1) by the grant of discretionary power to the Collector to refuse licenses to notorious destroyers of game, who hitherto obtained licenses freely. These men, it is thought, will in future be brought more under control by this means. (2) By Badagas and Kurumbers having been frequently and successfully prosecuted for slaughtering game. Their propensity to do so for fresh meat is believed to be almost incurable, and to be kept under only by constant watchfulness, and even then the evil will, it is thought, only be mitigated, not eradicated. (3) By asking Managers of estates to prevent their coolies poaching, which otherwise is extremely difficult to detect. (4) By dealing with shikaris, who are known to egg on young and excitable sportsmen to shoot miniature and undersized stags, whereby undesirable trophies are the only thing procurable.

Of imported game birds—the Association has obtained jungle and pea fowl,—the red variety of the former from Ganjam and the latter from the Godavery. The latter have been liberated at Ithalar, in the neighbourhood of which they formerly used to thrive. The red jungle fowl are with Sir Frederick Price who has undertaken their domestication. The pea fowl are to be protected by the reservation of the tract in which they have been set free, but this alone, it is believed, will not save them from the depredations of vermin, since already the feathers of some of the young birds have been found strewed about the localities indicated.

As a further concession to the members of the Ootacamund Hunt, permission to shoot jungle sheep with shot is to be continued. During the past season 14 of this game were destroyed in this manner, and the Hunt did not complain of the hounds being diverted from their legitimate quarry. The disturbance and destruction of sambur, contended for by the Hon'ble Mr Stokes, will be continued in the future on the same lines as in the past, namely, to

limit the destruction to the Master, and the disturbance to the District Forest Officer.

By limiting the shooting of ibex to one saddle-back, a measure of protection seems to have been afforded these shy creatures, rapidly diminishing in numbers, since, during, the 12 months ending with June last, only three ibex were shot, and one of these turned out to be a brown buck. In this connection, the Honorary Secretary complains that sportsmen, who were asked to send in the heads and skins of ibex killed have failed to comply with the request, and that, for this reason, it will have to be made compulsory in future.

Major Bagnall is aware only of one large trout captured last year, and that was a female, weighing 5½ lb., full of spawn, which was discovered too late to restore it to the water. He fears that any trout in Burnfoot Lake, that is fouled by the work going on in the construction of the Tiger Hill Reservoir, have perished, as some dead fish were seen floating on the surface of the water. He suggests that when the fouling is over, as it will be when the dam is completed at the Reservoir site, arrangements with the proprietor should be made to re-stock it. The carp of Pykara River were netted and placed in other streams that will suit them, and in the Ootacamund Lake.

The Game Association maintains a record of game shot each year, but this is necessarily incomplete, since sportsmen will not communicate their successes in the field; but from what has been reported it is noted that 14 heads of sambur, measuring over 30 ins., were secured in the 12 months. One head shot at Kotagiri had horns that measured 33¼ ins.; it was remarkably symmetrical, although 2 ins. short of the record, and the brow antlers were 17⅜ ins. Another good head was secured on the Succoth Estate. It was the best of the season, but in massiveness a head from Kotagiri beat it. The left brow antler in this latter case was 16¼ ins. and the right 17¾ ins.

A black panther was shot on the Koondahs, last season 6 ft. 7 ins. in length. It was the largest black panther ever seen on the Nilgiris. Of bears, two, 6 ft. in length were shot, one at Kolakumbay and one at Kodanad. A tiger was killed on the Koondahs, which, judging by the size of head and skin, must have taped 9 ft. 8 ins.

A consignment of 20,000 trout ova is expected to arrive in Bombay on the 6th proximo. Mr. Van Ingen, the Taxidermist, who has had some experience in the matter goes to Bombay to receive the ova, and arrange for their safe conveyance to Ootacamund.—*Madras Mail*, Feb. 24.

SUNFLOWER AS AN INDUSTRY.

(*From a Madras Correspondent.*)

The sale on the Baltic of 300 tons of sun-flower seeds at £11 5s. per ton serves as another reminder to people, that the *Helianthus* or sunflower is one of those crops in which there is money. A small trade has been done in the seeds for close on two centuries in Russia, France, Germany and Italy, but in England the cultivation has been exclusively for ornamental purposes. In America it has recently formed the subject of a special report to the United States' Department of Agriculture. This report shows that the plant can be grown successfully but that it is a crop which makes a considerable drain on fertilisers. The report also shows that the cultivation of the flower would prove commercially advantageous, and that the methods pursued for growing Indian corn should be followed. It is largely cultivated in China and Tartary; it spreads with comparative rapidity; and, in Simla and other hill stations, where it was introduced into gardens, it may now be found growing wild. The Jerusalem Artichoke or *Helianthus Tuberosus* is believed to be a native of North America. It was introduced into Europe about three centuries ago, from there into India, and soon became an article of diet, the people of Kathiwar reckoning it a very nutritious vegetable and most palatable when boiled in milk. The seeds are sold in Russia and eaten as nuts, and when torrefied in the same manner as coffee, may be used as a substitute for it. They are also considered beneficial to poultry and to birds generally, and possess, moreover, medicinal value in the treatment of farm animals. Cows and oxen, horses, sheep, pigs, rabbits and poultry are all fond of them, and they are considered superior to linseed for cattle, which are also fed on the oilcake. It is however, on account of the oil that the plant has now assumed such commercial importance. In its pure state this oil is said to be excellent for the table, and in Russia it is already in use as an adulterant of almond and olive oils. It may be advantageously utilised for woollen dressing, lighting, and candle and soap making. Somehow, the oil expressed many years ago from seeds of plants experimentally cultivated in Bangalore was a disappointment commercially, for it was inferior as a table oil, its thinness made it useless for railway trains, it dried too slowly for paint, and, though in the Ordnance Department it was found to serve all the requirements of the Arsenal, the price was prohibitive. Some species of the sunflower, such as *H. thurifer*, secrete a resinous juice, which some day may be utilised. The blossoms furnish a bright and lasting dye and the stalks of the plant yield a useful textile fibre, while bees are largely attracted to the flowers.

It was at one time believed that the sunflower possessed great value in the reclamation of marshy tracts of land besides the property or removing malaria from swampy areas. To test this theory, cultivation was undertaken in Bangalore about 30 years ago but the virtues of the plant proved to be imaginary.

In Russia where the cultivation for oil is on a large scale, the *grandiflora* is the variety grown. The species which the natives of India have for a long time cultivated is the *H. Annus* of modern botanists and the *H. Indicus* of Linnæus. This was at one time believed to be a native of India, and it is probably to this genus that reference is made in the history of the reign of Akbar.—*Capital*, Feb. 20.

TOBACCO-GROWING IN TRINCOMALEE.—"J. B. C." 's seasonable letter elsewhere should excite interest in the peninsula as well as at Trincomalee. We shall welcome up-to-date replies to the request for Jaffna information on the topic.

CACAO STEALING.—It is almost incredible that the Cacao Planters of Ceylon should, directly and indirectly, owing to the depredations of cacao thieves, be submitted to bear a loss of 25 per cent annually on their crop. Such is the case, however, and the Cacao Committee of the Matale and Kandy Association which met on the 17th inst., give good ground for the motions they passed praying the Parent Association to approach Government on the subject. Under existing legislation it has been found impossible to suppress the evil, and in many cases although planters were morally certain of the thieves they could not prosecute with any prospect of success. Rural Police have, after a fair trial, proved a failure and indeed the only preventative at present is "small shot and fire low." Cacao planters are a law abiding people, however, and do not wish to take the law into their own hands and have so far refrained from this effective cure. Government cannot we think, if the matter is properly represented to them, abstain from devising some special method of preventing this wholesale robbery, a measure like the coffee stealing law is wanted.

INDIAN AND CEYLON GREEN TEA.

HOW TO ADAPT IT FOR THE AMERICAN MARKET. —'GLAZING' WITHOUT ADULTERATION.— THE CHINESE FACING 'FAKE' EXPOSED.

By H Drummond Deane (specially contributed to "TEA)."

In dealing with the subject of green tea and its manufacture and suitability for the American and Canadian markets, I must premise that, beyond a small experimental invoice from this estate, I have so far been unable, partly from want of a steam boiler and partly through being more or less in the hands of London Agents, to go in for these teas on a large commercial scale. Still almost every pound (if not quite every pound) of green tea that has been shipped in the last two years to America or Canada from Ceylon and most, if not all, of the Indian green tea now finding favour in those countries, has been made on my system and with a machine of my invention for the steaming process.

My first attempts in this direction were made in 1887 when I returned from visiting China and Japan and making a special study of the Japanese manufacture. I came to the conclusion that what was suitable for the small holdings of Japan would be too costly a process on account of the hand labour involved either in Ceylon or in India, and further modification in manipulation must be made to deal with the fine large-leaved varieties of the Indian indigenous tea plant.

In 1889 or 1890 I made and sent to London my first complete invoice of 'Ceylon Green Tea.' The prices were most satisfactory, averaging all round, as far as I remember, about 1s 2d per pound. The teas were sold as 'Kintyre' Estate Green Teas by Messrs. Wilson and Smithett. I continued to ship Green Teas for some time afterwards to a firm called, I think, Messrs Chas. Lamb & Co. of Philadelphia. Finally I took a first award for Green Teas at the Chicago Exhibition.

There is abundant evidence at present that Ceylon and India can and do produce a first-class article in Green tea of 'Moyune' type, as regards liquor, and with perseverance a large business will in the end bo built up.

THE PLANTER'S DIFFICULTIES.

The difficulties to be overcome are three in number. First of all, there are the vested interests of the American merchant in the China and Japan trade. Secondly, we have to contend with the ignorance of the public in general as to what the true appearance of a Green Tea should be. They have been so long accustomed to the 'faced' teas of China and Japan and the small leaf from the dwarf variety of plant common to those countries, that it must take time for our plain looking but far more economical and purer teas to get the attention they deserve. In the third place there is the difficulty from a Planter's point of view of getting rid of fannings and small broken teas, which, as with Pekoe fannings and broken orange Pekoes in black teas, are almost the finest liquoring and most economical teas made, were it so understood by the American and Canadian housekeeper. But in China and Japan these grades of tea are consumed in the country itself and not shipped as they do not lend themselves to the 'faking' process known as 'facing,' so it is an unwritten law in America and Canada that broken teas must be avoided, and tho problem at present is what to do with them, as we have no Green Tea drinkers on this side.

I am of opinion that our able Commissioner should do his best to introduce these teas to Americans, proving by the test of the teapot what fine flavoured economical teas they really are—in nearly every case better than whole leaf 'Imperials' or grades answering to Pekoe and Pekoe Souchongs of black teas.

COMPRESSED TEAS.

In order to encourage the production of Green Teas by Indian and Ceylon Planters, arrangements should be made to send out to Calcutta and to Colombo the most modern Hydraulic Presses for pressing these teas into 'Compressed Cakes,' like cakes of chocolate, the cakes to be stamped by the Indian and Ceylon Tea Associations. Until such time as the prejudice against this grade of tea is lived down, either the bonus should be paid to producers on their grades, up to, say 10 per cent of an invoice or the teas should be bought by the Association at least at the average cost price of manufacture, and made into compressed tea, any profit over and above, say 10 per cent being divided among the producers as a bonus after sale and realisation.

HOW CHINESE GREENS ARE PRODUCED.

'Facing' teas as is done with over two-thirds of the China and Japan teas is done in the following way. The tea is bought from door to door, village to village by travelling buyers. It is about three-quarters fired at time of purchase. It then finds its way down to the treaty ports, where it undergoes sorting and bulking. The bulked teas are taken to the 'Hong' or firing house which as a rule contains from 100 to 600 iron pans heated by charcoal fires. About a pound or two of tea is poured into each pan which is warmed, but not hot at that step. The warmth for the moment renders the three-quarters fired tea slightly flaccid. A spoonful of a mixture of soapstone, gypsum and indigo or Prussian blue is quickly put into each pan, and a cooly in charge of each commences rolling the tea in the pan, the fires being banked up, and the heat increased until the tea is finally fired. Meanwhile the glaze or facing has been thoroughly rubbed into the tea, giving it that shiny peculiar colour always apparent in Chinese and Japan Green Teas. The mixture is apparently harmless, but there is no use for it, except to keep up the tradition that 'Green Tea' should have this peculiarly coloured, plumbago-like appearance. Now Indian and Ceylon Greens can, if wished, be given a glazed appearance without any adulteration simply by the use of the juice of the Tea Plant. To illustrate my meaning, I am posting you under separate cover, three samples of Green Tea, identically the same tea—Plain, Glossed and Glazed. Perhaps the glazing is a little overdone, but the amount can be regulated. I do not consider the liquors of these particular samples quite A1, as they are purposely made off a Hybrid Tea grown on poor soil; but I feel certain the expert you show them to will say the teas are pure and good teas, and quite able to hold their own for quality with an average good Japan tea at least so I am advised by Calcutta and Colombo experts.

THE COST OF PRODUCTION.

Anyone working on my lines can, without any extra expense beyond ordinary rolling and drying machinery and a steam boiler, turn out a similar class of tea (the quality depending, of course, on jat elevation and soil,) with no extra expense beyond the £40 charged for my Patented Steam Apparatus. As the best Green Teas are made in the rainy season, factories that can't manage to wither black teas on account of insufficient space in wet weather, when leaf often takes two to four days to wither, can avoid all increase in capital expenditure in the shape of withering accommodation by making 'Green Teas' during the wet months.

One word more. Green Teas must be divided into two classes, viz. True Greens which are entirely unfermented, and Green Teas that are in part fermented, commonly known as 'oolongs.' These latter are represented in India by so-called 'Kangra' Green Teas, good teas of this class, but by no means up to the Greens of 'Moyune' type. There is no reason why Kangra, Cachar and Sylhet should not each produce magnificent Green Teas, when working on the system I advocate and I am glad

to say that the few gardens now experimenting are getting most satisfactory reports on the results. I am strongly in favour of bulking and re-firing at the shipping port, as, until this is done, it will be impossible to send continuous matched breaks of tea. In Southern India in spite of the wretched prices—many estates are getting, in many cases less than 5d average—no one has so far attempted Green Tea manufacture but myself. The reasons for this are two-fold—first, the reluctance of London agents to lose the sale of the teas, and the want of American firms willing to finance estates, i.e, issue credits against crops to Producers; and secondly, the question as to how to dispose of fannings, or say 10 per cent of the crop.

FAVOURABLE REPORT BY EXPERTS.

The Committee of the Indian Tea Association in Calcutta have had under consideration a report by their experts upon certain samples of green tea which had been submitted by Mr. Drummond Deane. The report was to the effect that the samples were good types of green teas which would be useful to show to managers who required standards. They are however, decidedly superior to most of the teas which had been previously examined and were probably too good to fix as standard for a blend. If such teas could be easily made, the success of the industry was certain. This report was noted by the Committee with much satisfaction; and they decided to forward copies of it to Mr. Deane for information. A circular was also to be addressed to the members of the Association, giving the views of the experts upon the samples, and stating that the latter were available for the guidance of managers.

In writing to the London Committee the foregoing facts were to be stated, and the question of blending green teas in Calcutta—which was raised in the Circular No. 61 of September 9—was to be dealt with. The difficulty of carrying through any definite scheme of this description was the uncertainty in regard to funds. And the London Committee were to be asked if they had any proposals to advance which might be calculated to surmount this difficulty. Looking to the fact that special machinery was required for the manufacture of green tea, it was, the Committee thought, unlikely that proprietors would care to engage in it unless the bounty could be definitely promised to them during the interval which must necessarily elapse before a good demand at remunerative prices could be created.

NILGIRI GAME ASSOCIATION.—As will be seen from the report which we give on page 630, this Association has done very useful work during the past year and the result of the protective measures adopted is that there has been an increase of game. Interesting details are given as to what has been done in connection with the importation of game birds and the shooting of jungle sheep, sambur and ibex. Trout culture has also received attention.

PALLEGAMA GRANT ASSOCIATION.—We regret extremely to read in the report, which we give in the next column, that there is no alternative left but to wind up this Association, the directors finding it impossible to maintain the 500 acres in cultivation as stipulated in the Government lease, owing to the animal pests that affected coconuts and the unprofitableness of coffee and cocoa. The termination of the enterprise is much to be regretted, but it is some consolation to know that the timber belonging to the estate is considered sufficient to pay the outstanding liabilities and the expenses of winding up.

THE KANAPEDIWATTIE TEA COMPANY, LIMITED.

REPORT OF THE DIRECTORS.

The Directors beg to lay before the Shareholders their Reports and Accounts of the working for the year ended 31st December, 1901.

The crop secured from estate leaf amounted to 169,614 lb, on an increase over last year of 18,493 lb. and of 9,614 lb. as compared with the original estimate of 160,000 lb. From bought leaf 22,355 lb. Tea was also secured, making the total crop 191,969 lb, which (after deduction of amounts received for manufacture of outside Tea) cost to lay down in Colombo 22·18 cents, and obtained a net average price of 29·17 cents. The usual table showing the crop, cost and average of the tea is appended for purposes of comparison :—

	1898 Crop			1899 Crop		
From Estate Leaf	142,267	cost	23·11	151,030	cost	21·92
From Bought Leaf	30,330	av'age	32·71	38,565	av'age	36·16
Total lb.	172.597			189,595		

	1900 Crop			1901 Crop		
From Estate Leaf	151,121	cost	24·07	169,614	cost	22·18
From Bought Leaf	52,195	av'age	27·72	22,355	av'age	29·17
Total lb.	203,316			191,969		

The net profits for the year amount to R18,104·26 and, after adding the balance brought forward from last year, namely R95·68 a sum of R18,199·94 becomes available for distribution. Of this amount, R6,680 was absorbed by the payment of an interim dividend to the 30th of June last of 2 per cent, and the Directors leave it to the meeting to decide what dividend shall be declared out of the available balance R11,519·94.

Mr. W P Metcalfe resigns his seat on the Board owing to his departure for England, and it will be necessary to elect a Director in his place.

An Auditor will also have to be elected for 1902.

PALLEGAMA GRANT ASSOCIATION OF CEYLON, LIMITED.

In submitting the balance sheet and profit and loss account to the 31st December, 1901, the Directors regret to have to inform the Shareholders that His Excellency the Governor, on behalf of His Majesty the King, the Lessor of the Grant, has refused to renew the Lease, which has therefore terminated. Under these circumstances the Directors have no alternative but to recommend that the Association be wound up voluntarily.

The timber now lying in the Central Timber Depot, consisting of 180 tons 13 cwts. 2 qrs. 14 lb. Ebony and two logs Satinwood, will, it is expected, be sufficient to clear all outstanding liabilities and pay the expenses of winding up.

The Directors can only express their regret at the unfortunate termination of this enterprise, upon which they have bestowed every possible care and attention. The unfortunate failure of cocoa and coffee and the difficulties arising from animal pests which attended coconut cultivation rendered it impossible, with the capital at their disposal, to maintain the 500 acres in cultivation, as stipulated in the Lease, and in consequence of this the Lessor has refused to grant a renewal.

BALANCE SHEET MADE UP TO DEC. 31ST, 1901.

LIABILITIES.—To Capital :—2,000 shares fully paid R200,000; Debts due by the Company :—Loan Account R1,352; Agents and Secretaries R3,004·99; National Bank of India R7,094·64.—Total R211,451·63

ASSETS:—By Property (Immovable) R201,883·84; by balance of profit and loss R9,567·79.—Total R211,451·63.

PROFIT AND LOSS STATEMENT made up to 31st December, 1901.—To interest R350·65; to Timber account R9,217·14.—Total R9,567·79. By balance at debit carried to balance sheet R9,567·79.—Total R9,567·79.

THE RAYIGAM COMPANY, LTD.

REPORT OF THE DIRECTORS.

Directors:—Messrs Edward Rosling, Albert Rosling, Gordon Fraser, and F M Mackwood.

Acreage:

RAYIGAM.	Acres.	ANNANDALE.	Acres.
Tea in bearing	... 551½	Tea in bearing ...	250
,, partial bearing...	126	Forest ...	8
,, not in ,, ...	18	Grass	38
Forest	504½		
Total ...	1,200	Total ...	296

The Directors herewith submit their Report and Balance Sheet for 1901.

After writing off R1,506 for depreciation on Building and Machinery, there remains at credit of Profit and Loss Account R12,025·39. Out of this the Directors propose to pay a dividend of two per cent absorbing R1,000, carrying forward a balance of R25·39.

The crop of tea from Rayigam was 294,110 lb as against 305,974 lb in the previous year, and from Annandale 85,929 lb against 103,988 lb.

The shortness in crop on both estates is partly due to finer plucking and partly to unfavourable climatic conditions.

The nett prices realized by Annandale and Rayigam Estates respectively were 44·11 cents and 28·03 cents per pound.

The Estimate of crop for the current year for Rayigam is 300,000 lb, and for Annandale 100,000.

Mr Gordon Frazer retires from the Board of Directors by rotation, but being eligible offers himself for re-election.

The election of an Auditor for 1900 rests with the Meeting.

NEW PLANTING COMPANY.

HENRY ROLL & CO. (72,579).—Registered January 25th, with capital £5,000, in £1 shares, to acquire the business carried on at 66, Storks Road, Bermondsey, as Henry Roll & Company; to adopt an agreement with H. Roll, and to carry on the business of tea, coffee, cocoa and other Eastern and Colonial products, planters, growers, importers, blenders and merchants, lead rollers, printers, produce brokers, tobacconists, warehousemen, wharfingers, etc. No initial public issue. The number of directors is not to be more than 4. H. Ross is the first; qualification £1,000; remuneration is fixed by the Company. Registered office, 66, Storks Road, Bermondsey, S.E.—*Investors' Guardian*, Feb. 8.

THE DUTY ON TEA.

We are glad to see a writer signing himself "Fairplay" refutes some of the rather wild statements made on the occasion of the deputation to the Chancellor of the Exchequer. He states:—

Whilst sympathising with those suffering from the depression in the Indian and Ceylon tea industry, I regret to notice a want of fairness displayed in the unkind and unwarranted reference to China tea as "a cheaper but inferior article." It must be well-known to the deputation, although possibly not to the general public, that China tea is not a cheaper article, in any sense of the word, than either Indian or Ceylon. In truth, Indian and Ceylon tea is really the cheaper, inasmuch as it goes further, owing to the way it is mostly prepared, and also to the public taste being for a thick and strong tea, to which large quantities of milk and sugar are added: in fact, in the majority of cases, it is most essential that they should be added to make the tea at all palatable. China tea on the other hand is more delicately flavoured, and does not naturally draw a thick, dark infusion; hence it does not appear to go as far in household economy as Indian or Ceylon tea. It is not a cheaper article in this sense, nor is it a less costly one to bring to this market. There is an export duty on China tea of about ¾d per lb., and inland taxes varying from ¼d to ¾d per lb.; it also bears an additional freight of about ⅜d to ½d per lb., thanks to a Steamer Conference which maintains rates at 45s per ton, whilst Ceylon rates are about 20s. The average price obtained for the tea crop in the China market is certainly just as high as, if not higher than, the Indian and Ceylon crops have averaged during the past two or three years. So much for the danger of China as a competitor for cheapness.

As regards quality, I venture the opinion that China tea is fully equal to that of British-grown teas, but the taste of the large majority of tea-drinkers in Great Britain favours the latter. This, however, does not say that the quality of the British-grown article is better, but that the character is preferred by most people in this country, although it is a fact that several leading physicians recommend the China growth, and that many experts in the Indian and Ceylon trades prefer China tea for their own use. The Chancellor of the Exchequer, I think, struck the true cause of the depression in the tea trade—namely, over-supply. In their anxiety to compass China's tea trade, the Indian and Ceylon growers have brought on their own disasters, for China consumes itself some three-quarters of her total production of tea, and endeavours only to prepare as much for export as it can find a profitable market for. During the present season the export to all parts of the world, from China, is about 140,000,000 lb. (British-grown tea, for the same period, being about 300,000,000 lb.), against 170,000,000 lb. last season, the reason of the deficiency being that, owing to the low prices ruling in foreign markets, it paid the Chinese better not to prepare about 30,000,000 lb. of their later crops for foreign use, finding a better market for it in home consumption. If India and Ceylon would take a lesson from China, and study supply and demand a little more, I venture to say that there would soon be no laments as to the unsatisfactory state of the trade. China has always been an honourable rival of India and Ceylon, and I think the remarks referred to, tending to depreciate its produce, are as unfair as they are incorrect.—*L. & C. Express*, Feb. 14.

"PEARLS AND PEARL FISHERIES."—We notice that a lecture on this subject was given by Dr H Lyster Jameson at the Derby Lecture Institute on Feb. 14th.

THE TEA DUTY.

INFLUENTIAL DEPUTATION TO THE CHANCELLOR OF THE EXCHEQUER.

PRODUCERS, BROKERS AND BUYERS PROTEST AGAINST AN INCREASE OF THE DUTY,

A SYMPATHETIC REPLY.

The suggestion that the duty on tea should be again increased was received with surprise and consternation in London as well as in India and Ceylon, and the views of producers of British-grown tea, and of the brokers and buyers who handle it at home, were laid before the Chancellor of the Exchequer by a joint deputation which waited upon him on Tuesday, February 4, at the Treasury, Whitehall. To avoid the inconvenience that has been caused on former occasions, Sir Michael Hicks-Beach decided to limit the number of Pressmen at the interview to three, one of whom has reported the proceedings for the *Ceylon Observer*.

The deputation was introduced by Sir H Seymour King, M. P., and it consisted of the following gentlemen :—

INDIAN TEA ASSOCIATION (London): Messrs. Arthur Bryans (Chairman). J N Stuart, G Henderson, C C McLeod, and Ernest Tye (Secretary.) CEYLON ASSOCIATION IN LONDON: Messrs. H Bois (Chairman), R A Bosanquet, Brown, A Thomson, and W Martin Leake (Secretary) TEA BROKERS' ASSOCIATION: Messrs. Arthur Thompson, F S Long, S H Cheshire (Chairman and A G Stanton. TEA BUYERS' ASSOCIATION: Messrs. J Innes Rogers, (London Chamber of Commerce), Lecky and Appleton.

Sir Michael Hicks-Beach was accompanied by his private Secretary, Mr Hicks Beach, and his official private Secretary, Mr Lawrence Guillemard.

Sir H. SEYMOUR KING, M.P., said :—I have been requested as president of the Indian Tea Association, London, to introduce to you a deputation representative in the very highest degree of the tea-planting industry in India and Ceylon. In the first place I should like to express their acknowledgments to you, Sir Michael Hicks-Beach, for your courtesy in giving us a portion of your very valuable time to hear first-hand what they have to say for themselves in deprecation of any further advance in the duty on tea, and also in pointing out to you how hard is the pressure on the industry of the duty as it at present exists. That the industry is an important one you will readily agree when I tell you that in India there are 520,000 acres of land planted in tea, with an invested capital of £20,000,000 and an output of 180,000,000 lb. of tea per annum. More than one-quarter of that total is represented by the gentlemen now in this room. In Ceylon there are 387,000 acres in cultivation, with £15,000,000 invested, and an output of 145,000,000 lb. The other gentlemen who are present are representatives of the Tea Brokers' Association and the Tea Buyers' Association, so that all the interests concerned in this article are represented here today.

MR. BRYANS FOR THE INDIAN PRODUCERS.

Mr ARTHUR BRYANS said he appeared on behalf of the Indian Tea Association, and in the first place he wished to thank Sir Michael Hicks-Beach for receiving them, and giving them an opportunity of addressing him on a subject which was of almost vital interest to them. The Indian Tea Association, with its Calcutta branch, might be taken to represent the whole of the tea industry in India ; as Sir H. Seymour King had said, it represented an area of some 520,000 acres of tea, which yielded last year a crop of 187,500,000 lb. of the sterling value of £5,664,000. The Chancellor of the Exchequer would doubtless remember that in 1900 they addressed a memorial to him on the subject of the duty, and the arguments they had used then certainly applied with equal force now. To put it briefly, their industry was in a bad way. It was one with which he had been connected since 1869, and though during those 33 years they had seen their ups and downs they had never passed through such a prolonged period of depression as they had been suffering from since about the middle of 1900. This depression was still with them ; indeed, he regarded the year 1902 as likely to be the most crucial of any that they had passed through. For these bad times over-production, as the Chancellor of the Exchequer was doubtless aware, was partly responsible, but this did not make the bad times any the less onerous to them. With regard to this question of over-production he would like to draw the Chancellor's attention to the fact that from the time the tea bushes were planted some 3 or 4 years had to elapse before they came into bearing, and therefore the planting which had recently given them the over-production from which they were to some extent suffering had all been done prior to the extra duty being put on in March, 1900, And when this planting was done they had no reason to anticipate that their industry would be subjected to an increase of taxation—indeed, a lower duty on such articles as tea seemed to be the more likely policy. It was particularly unfortunate that just at this period it was deemed advisable to make an addition of 50 per cent to the then existing duty. It was hoped that this addition would be of temporary operation, and they had recognised the necessity and uttered no complaint. But when they saw that the increase was to be more lasting than they, or Sir Michael Hicks-Beach, had thought when it was imposed they had approached him and asked him for relief. He (the Chancellor) did not see his way to grant them what they wished, but he held out some hope in his Budget speech and again when speaking on the Finance Bill. He (the speaker) trusted that Sir Michael would pardon him for reminding him of what he had said. In the Budget speech on April 15, he said : "I turn to tea. Tea has already been taxed up to 75 per cent of its value. It is produced mainly in India and Ceylon, and it is a product in which our fellow-subjects at home and abroad are deeply interested, and the trade—largely, I think, owing to over-production—is not in a very satisfactory condition. I do not think we ought to increase the duty on tea." And in his speech on the Finance Bill the Chancellor of the Exchequer said: "If it should ever be my happy lot to be able to reduce taxation, I should be disposed to reduce the duty on tea rather than on beer and spirits." If the Chancellor's "happy lot" had not arrived yet, they certainly hoped it would soon come, and that on the present occasion he could at least hold out some hopes to them. At present tea was taxed up to 75 per cent of its value. Although there had been a rise in value of the lower grades, the medium grades showed little

improvement and the higher grades none at all. That this taxation did affect producers was easily proved. In 1890 the duty was reduced from 6d. to 4d. per lb. and the result was two-fold. There was an immediate increase in consumption, which rose from 189,500,000 lb. in 1889 to 194,000,000 lb. in 1890, although the remission of duty was felt during only eight months of that year. But consumption rose to 202,500,000 lb. in 1891, showing quite an abnormal increase of 8,500,000 lb. in that year. The other effect was an increased demand for lower grades, which formed the bulk of the consumption. To such an extent did this go that they increased in value almost as much in amount as the amount of the duty remitted, When, however, the Chancellor reimposed the duty in March, 1900, the reverse happened, and the price of lower-grade teas fell fully 2½d per lb., and the average price of all Indian tea was reduced from 8¾d. the price in 1889, to 7⅝d. in 1900, and to 7½d in 1901—proving, as they thought, that to a great extent that tax fell upon the producers.

The Chancellor of the Exchequer: You have given over-production as the cause.

Mr. Bryans replied that that was partly responsible, but the fall would not have been nearly so much as it was but for the extra duty. The later rise in price had been obtained by a great decrease in the yield per acre. The season had been a bad one for crops, and the small increase in price was by no means a gain to them, for a small crop cost more per lb to produce than a large one. Indeed, the industry as a whole was most unsatisfactory, as was evidenced by the marked decline in all the Companies' shares. The market value of 45 Companies' shares in July 1897 was £11,000,000, in January 1900 it was £9 600,000, in January 1901 £8,550,000; and at present it was at some figure below £7,000,000. There were many millions sterling hardly earning any dividend —— and it was at this moment that a great newspaper and a great statistician advocated a great increase of duty! What the Chancellor of the Exchequer said last year showed that he appreciated that the industry was passing through a severe crisis in its history, and that this crisis would continue there could be no doubt. Every possible assistance by way of duty was absolutely necessary if they were to survive. The rival beverages paid no extra duty and tea from China was practically bounty-fed. He hoped Sir Michael Hicks-Beach would not think they had stated their case too strongly, and that he would be able to send them away with some crumb of comfort after he had heard them.

MR. H. BOIS FOR THE CEYLON ASSOCIATION.

Mr Henry Bois said that as the president of the Ceylon Association in London he had to speak on behalf of the tea producers of Ceylon, who were to a great extent represented by the Association. There were 387,000 acres of land under tea cultivation in Ceylon, producing 145,000,000 lb of tea, and representing an invested capital of £15,000,000. When the extra duty of 2d in the £ was imposed on tea in 1900, the tea producers of Ceylon did not make any representations to Government as to the effect the tea duty would have on the industry, and perhaps their inaction on that occasion had been somewhat misunderstood. It had been perhaps assumed that they made no protest because they thought that the extra duty would to a great extent fall upon the consumer and that their interests as producers would not be affected by it. That was not the case. There was a general apprehension that it would fall largely upon the producer. They had been animated by other motives. The tea producers in Ceylon and India were not less patriotic than British subjects in other countries; they recognised that the Empire had been forced into a very costly war, and they did not wish to appear unwilling to bear their share of the burdens. But later they had seen that the extra duty had fallen almost entirely upon the producer, and they addressed to the Chancellor of the Exchequer a memorial pointing out the depressed state of the tea industry and asking that the duty should be reduced. He did not think they had any sanguine expectations that it would be reduced, but they desired to put the case before the Chancellor in order to show how adversely any further duty would bear upon them. He (the speaker) thought that no formal answer was received to that memorial, but in Sir Michael Hicks Beach's Budget speech some time afterwards he referred in sympathetic terms to the statement they had put before him, and although he laid stress—and, he (the speaker) thought, justly—upon the fact that the pressure had been caused by over production, he stated that the tea industry was a British industry which was already taxed to about 80 per cent of its value, and that when the time came for reduced taxation tea would be the first to receive consideration.

Chanceller of the Exchequer: Before two other articles, I said.

Mr Bois, proceeding, said that with that statement by the Chancellor of the Exchequer the tea producers had remained satisfied, and they would be satisfied still but for the fact that proposals had been put forward to still further add considerably to the tea duty. They were quite aware that suggestions from unofficial sources, however distinguished the individuals might be, must not be taken as representing the views of His Majesty's Government; but it was a fact that the proposed increase in the duty had caused wide-spread consternation in Ceylon and India. He had received a letter from the Chairman of the Ceylon Chamber of Commerce on the preceding day, saying that if the Chancellor of the Exchequer listened to these suggestions it would just about finish us." The position of the tea industry at the present moment was one of very great financial depression. In 1900 the price of Ceylon tea fell ⅝d per lb, and in the following year it fell ⅛d per lb —and in this second year the actual fall in price was not the full measure of the difference in price between that and the preceding year, because owing to finer plucking which had been resorted to with a view to reducing output, the quality of the tea was much better in 1901 than in 1900, and consumers paid ⅛d per lb less for tea which was from ⅝d to 1d per lb better in quality. There had also been a slight increase in the cost of production. There was a certain fixed amount of expenditure on the estates, and if the quantity of tea produced was reduced, it followed that the cost per lb. was increased. As regarded 1900, he was not prepared to lay any great stress on the reduction in price in that year, because there was justice in the Chancellor of the Exchequer's remark that it was largely due to over-production. But 1901 was not a year of over-production, and it was fair to assume that

to a very large extent, if not altogether, the difference in value is due to the additional duty. The producers' position was that they were only getting their tea into consumption at a reduced price. He thought it was a fact that the consumer was paying very little more for his tea on account of the increased duty; at a fair estimate the producer was paying from 1¼d to 1½d per lb, on account of the increase, the consumer paying the balance, not perhaps so much in price as in quality, he having received tea of slightly inferior quality in some instances for the same money that he had paid before. It was impossible to precisely indicate the cause of the fall in prices, but there could be no doubt whatever that the tea industry in Ceylon was in a very depressed state, and no fairer index of the condition of things could be had than the marked value of the companies' shares. Almost without exception the Ceylon tea companies were capitalised on the fair basis of 10 to 12 years' purchase. They were agricultural Companies, no element of speculation entering into their operations, and dividends had been declared upon the earnings of each year; and the dividends had regulated the market value of the shares. He held in his hand a statement showing the market value of the shares in 60 Ceylon Companies' at various periods. and he found that in 1896 the aggregate market value of the shares was R23,000,000; in 1897, R17,000,000; in 1898-9, R16,000,000; in 1900, R15,000,000; and in 1901 below R14,000,000. That was the position at present, and he was afraid there was no prospect of any immediate improvement :in fact, apprehensions were general that 1902 would be financially one of the worst years the tea industry had seen. Last year a great many of the estates had paid no dividends, some had paid lower dividends, others had produced tea at higher prices than they had sold it for, and results in the coming year would probably be still worse. However, this was not the position as regarded the more distant future, for which the prospects were statistically more hopeful. At the end of 1899 the over-production was 14,000,000 lb.; in 1900 the production of Ceylon and India together was 334,000,000 lb., and the consumption 314,000,000, an over-production of 20,000,000 lb., raising the surplus at the end of 1900 to 34,000,000 lb. In the following year consumption overtook production. The total production of India and Ceylon in 1901 was 328,000,000 lb. against a consumption of 337,000,000 lb. In the case of Ceylon the improvement in this respect was perhaps even more marked. In 1900, against a production of 148,000,000 lb there was a consumption of 142,000,000 lb, but in 1901 the production was 145,000,000 lb and the consumption 152,000,000.

The Chancellor of the Exchequer: Finding its natural remedy.

Mr Bois: We hope so, sir. I think that in future the evil will be remedied providing nothing is done to reduce consumption. This is a reason why nothing should be done that would check the industry. Continuing, the speaker said he thought that in the coming year tea Companies would have a very hard struggle, and he hoped they would manage to weather the storm; but looking a year or eighteen months ahead, if nothing were done in the meantime to further depress the industry he thought it would be found to be on a firmer basis. The two points they had guard against were over-production and checks to consumption. Planters themselves were taking measures to restrict the output, and as regarded consumption he thought that if no extra duty was imposed consumption would probably increase in a normal manner, and that at the end of eighteen months they might find the industry in a better position.

The Chancellor of the Exchequer:—There is one point which no speaker has touched upon. If you can show that the increase of duty has checked consumption you would show there was something important in it.

Mr. Bois:—It has not checked consumption, but our tea has gone into consumption because we have paid the duty. The consumer has got it at practically the same price as before.

The Chancellor of the Exchequer:—In other words, your over-production enormously lowered the price of tea in this country, and if no extra duty was imposed tea would have been very much cheaper. I don't think you can prove that the extra duty imposed two years ago has injured it.

Mr. Bois:—It has injured us to this extent, that consumption would undoubtedly have been checked had we not accepted a lower price for our tea.

The Chancellor of the Exchequer:—So far from consumption decreasing I think your figures show an increase,

Mr. Bois:—It has been increasing year by year, and it has followed the normal course. We say it would have been decreased had we not accepted a lower price.

The Chancellor of the Exchequer:—I have understood that through bad plucking some tea was practically valueless.

Mr. Bois said he must explain that climatic conditions were largely responsible for this. He (the speaker) would not say that producers were blameless, but as far as possible they had now applied the remedy. In conclusion, he thanked the Chancellor of the Exchequer on behalf of himself and his colleagues, and tea producers generally in Ceylon, for his courtesy in receiving the deputation and in listening to what they had addressed to him.

MR. A. THOMPSON FOR THE BROKERS.

Mr. Arthur Thompson said he spoke as a representative of the Tea Brokers' Association, and he was therefore one who should be fairly cognisant of the working of the trade in its various branches. He deprecated raising the duty, first on account of the disturbance it would cause to the home trade, both wholesale and retail, whose business was already seriously interrupted by the present duty. This must be the case with all dutiable goods, but the tea trade had been so upset by the late addition of 2d. per lb. that any further addition would prove disastrous, and this would be accentuated. In the second place, tea was no longer a luxury but a necessity of life, especially among the working class. The present tax amounted to about 80 per cent of the average value of the tea, and any increase in the duty would weigh most hardly on the poorer citizens and would check the expansion of, if not bring about a decrase in, consumption. It was true that the late increase in duty had not

apparently had this effect; since the duty was raised the consumption of rea had increased about 13,000,000 lb (equal to about 5½ per cent), 5 of which might fairly be put down to the natural growth of population, and a considerable quantity also to the abnormally low prices that had ruled almost all through the season. Meanwhile cocoa had increased 25 per cent., and coffee 23 per cent., and comparing these articles with tea be found that while the market values was practically the same—say 7½d per lb--the duty on tea was 6d, or 80 per cent, that on cocoa 1 5-8d, or 15 per cent, and that on coffee 1 3 4d, or 20 per cent. So that it would be seen that tea, which was practically a necessary of life, was even now bearing more than its fair share of taxation.

The Chancellor of the Exchequer:—Of course, you know that Mr Goschen reduced the duty on tea to 1d, but did not reduce that on cocoa and coffee. Practically the relation is the same as when the duty was 6d formerly.

Mr Thompson;—Yes, but it seems to me that tea as a necessity of life is bearing more than its fair share, in spite of the fact that of late cocoa is markedly increasing in use. Continuing, Mr Thompson said that any increase in the duty would be against the well-being of what was a purely British growth. Only 7 per cent. of tea consumed at home last year was of foreign growth. At least half of the extra duty imposed in 1900 was being borne by the producers. They had a capital out-lay of £40 per acre, with an average yield of about 485 lb., so that the profit per acre worked out at about £2 per acre, or only about 5 per cent on capital. So any further burden must seriously interfere with a most important trade of the Indian Empire and also of the island of Ceylon.

MR. J. I. ROGERS FOR THE WHOLESALE BUYERS.

Mr. J. Innes Rogers said, he represented the tea buyers of London, whose Association represented three-fourths of the buying power in the market. They were there that day for two reasons; first, to express their very great sympathy with the producers in the sufferings which had been entailed upon them by the late increase in the duty of 2d—[Sir Michael Hicks-Beach; you have not proved that, I think]—and second, to point out the interest of the wholesale and retail trade of the country in the question. He believed the producers had stated their case very moderately and in a convincing way. No doubt the main cause of their sufferings had been that production had greatly exceeded consumption, and whether the extra duty had been put on or not there would have been a considerable fall in the value of tea. But in his belief, and in the belief of his colleagues, the putting on of the extra 2d in duty had largely aggravated the trouble and accelerated the falling in prices. The public were used to a certain scale of retail prices for tea. That scale had not been appreciably raised. and, as to the actual price charged to consumers, they (the consumers) had not felt the 2d increase in duty. It was quite true that the consumer had had a lower class of tea supplied to him, and he had been satisfied with it; he had not paid materially more, but the loss had been on the producers and to a less degree on the retail distributers. Retail grocers had had to cut and contrive not to alter shop prices, but to keep up their standard grades, by altering quality, and so on, and they had succeeded in doing so. But this led to great stagnation in the market when enormous supplies were coming in, and the constant struggle on the grocers' part to buy cheaper and cheaper teas. and the consequent depression in value, were largely due to the 2d extra duty. But this state of things could not be repeated if a further increase in duty took place. It had been said, "You can't take the breeks off a Highlander," and if the duty were again increased the policy of the grocers must be altered. The scale of prices perforce could not remain unaltered, but would have to be raised if another increase in duty were decided upon, and the effect of this would be to decrease consumption. That, he thought, would be a very disastrous thing both for producers and distributors. The position of the grocery trade was a very peculiar one, and he thought it was worthy of more sympathy than the Chancellor of the Exchequer had sometimes been inclined to give it; because, excepting the publicans, grocers were the chief people to pay duties. An extra 2d in duty meant £200,000 extra capital looked-up for his wholesale colleagues and himself. They could not go on in that way, for another 2d would mean another £200,000.

The Chancellor of the Exchequer: But you take interest on your capital?

Mr. Innes Rogers:—We try to, Sir.

Mr. Lecky:—It's impossible to get interest on this capital.

Mr. Innes Rogers, proceeding said, he had made a careful estimate of their trade and had come to the conclusion that in the grocery trade the capital looked up in Customs and Excise duties was £3,000,000. He appealed to the Chancellor of the Exchequer not to add to that burden. Tea was an article that appealed to and was approved by everybody. The effect of an increased duty would be to drive people to drink common tea, and it would be very injurious to Indian and Ceylon producers. One point that nobody had yet touched upon was that the effect of an increased demand for common tea would be to add to the imports of tea from China. The China trade would force ahead at the cost of India and Ceylon. They appealed to the Chancellor of the Exchequer for consideration: he had given the Coal people some comfort, and they hoped he would do the same now, and send them cheerfully away.

THE CHANCELLOR'S, REPLY.

Sir Michael Hicks Beach, in reply, said: I have listened very carefully to all that the deputation have said to me. I recognise the importance of the great industry which you represent both to India and Ceylon, and to many persons in this country, and I can assure you that I have listened to you all the more carefully because I feel that it is not a question of taxing an article which comes from foreign countries, but one which comes to us from our own colonies and possessions, and in the production of which we are ourselves deeply interested. I do not suppose that you anticipated that I should be able to tell you anything in regard to a reduction in the duty on tea. I do not imagine that anybody anticipates any reduction of existing taxation in the year which is before us, and I think the object of your deputation today is

rather to impress me with the present condition of your industry and to put forward such arguments as you have put forward against any increase of the taxation in the coming year. For reasons which everybody who understands the export trade in coal is acquainted with I felt it possible to depart from the unvarying rule of Chancellors of the Exchequer, and gave to those who are interested in that trade a precise statement in regard to it. I cannot do so, and I think you will see it would be impossible for me to do so, with regad to any other forms of taxation. That must wait until the introduction of the Budget. I do not think you have shown that the increase of the tax two years ago did you any real harm. It no doubt was partly paid by the producing industry rather than by the consumers, from the extraordinary amount of over.production which in the same way, I think, has lessened the burden of the sugar duty on the consumers of sugar. But you have certainly put before me today some reasons which are important reasons against any further increase in the duty on tea. You, I think, anticipate that the over-production which naturally cheapened it—so that practically the tax had no effect whatever in decreasing consumption—may have ceased; that, in fact, those whom you represent have learned their own interests a little better than they had known them before, and that they will take care to send us in future rather a better article than was sent in 1900 or 1901. It is obvious, I think, that if these anticipations are realised a further increase in the duty on tea would have an effect in checking consumption which certainly we have not seen in regard to the last increase, and that would mean undoubtedly a burden upon great masses of our population and an increased cost on an article which, as you have pointed out, is already very highly taxed in proportion to its value—a point which any Chancellor of the Exchequer would be bound to consider. You have reminded me of what I said last year on this subject. I think I showed that I appreciated your difficulties, as well as the fact of the high existing duty on tea. I can only say today that I shall be glad to consider all you have put before me, with a full appreciation of the great interests that you represent.

Sir H Seymour King having thanked Sir Michael Hicks-Beach, the deputation withdrew.

THE PRODUCTION OF COCOA IN AFRICA.

A West Indian merchant writes to say that in a few years' time Africa seems likely to prove a formidable rival to South America and the West Indies as a producer and exporter of cocoa, and those interested in the West Indian possessions of the United Kingdom and anxious to see the islands more prosperous, will do well to watch how the cultivation of cocoa is being pushed on with satisfactory results throughout the continent of Africa. This year the German colony of the Cameroons hopes to ship 3,000 bags of cocoa, to be increased, it is estimated, to 10,000 bags in 1906. Our correspondent adds:—"Mr McClounie, head of the scientific department of British Central Africa, reports the successful shipments from Kew and receipt at Lomba of 210 plants, which had been planted out and were doing well. Lagos is also going in for cocoa, and one of her planters is now travelling in the West Indies to see how the estates are managed in Trinidad and Grenada." He also says that the little Portuguese island of St. Thomé has greatly increased its exports of cocoa in ten years, the shipments in 1891 being under 4,000 tons, whilst last year very nearly 16,000 tons of cocoa were exported.—London *Times*, Feb. 11.

PLANTING NOTES.

A Soil Map.—The United States Department of Agriculture is making a "soil map." The map is to cover the whole of the United States, and the scale (10 acres) to be represented by one-eigth of an inch square. Each farmer, however, will be able to procure a chart of his own neighbourhood on a larger scale, so that he can arrange his planting in accordance with the suggestions which it conveys. In the first place, the soil map will show what kind of agricultural industry any given locality is best adapted for. It will make clear to the farmer in one locality, for instance, that he has the same soil that is used advantageously for certain purposes in other localities, assuming similar climatic conditions. The map will call attention to certain troubles of soils which have been investigated through chemical analysis.—*Pastoralists' Review.*

Resources of the Straits Settlements.—According to a recent number of *Nature*, Mr H N Ridley, Director of the Botanic Gardens, Singapore, delivered a lecture at the Imperial Institute recently, entitled "The Economic Resources of the Straits Settlements and the Malay Peninsula." He remarked that the forests, which originally covered the whole peninsula, contain many valuable products, such as timbers, wood-oil, benzoin, gutta-percha, and rattans. Owing to the felling of trees by the Malays, gutta-percha, so indispensable for electric work, has been nearly exterminated. Fortunately, however, the product can now be extracted from the leaves and the twigs without injury to the trees, which are being planted by the Government. A very large area of the Federated States is under Coffee, but on account of the present glut of the market, and the consequent low prices, most of the planters are adding Para-rubber to their estates—a tree which thrives marvellously well, and produces a very satisfactory amount of rubber of the first quality. India-rubber from the "Ficus elastica" also promises well; but although it is being planted, its product is less highly valued. Accounts were given of the cultivation and preparation of Sago (one of the Sago-Palm gives as much nourishment as 163 acres of Wheat), Tapioca, Gambia, Mangrove-Cutch, Pepper, Nutmegs, Cloves, Indigo, and Pineapples. The greater part of the preserved Pines of commerce come from Singapore where the price of the fruit varies from a farthing to a penny each; and the lecturer remembered a time when they had been as cheap as sixteen a penny! The mineral resources of the colony include gold and tin, the latter being found in great abundance.—*Gardeners' Chronicle*, Feb. 1.

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transaction.
Agra Ouvah Estates Co., Ltd.	500	—	850	—
Ceylon Tea and Coconut Estates	500	..	—	—
Castlereagh Tea Co., Ltd.	100	—	95	—
Ceylon Provincial Estates Co. Ltd.	500	—	500	500
Claremont Estates Co., Ltd.	100	—	—	—
Clunes Tea Co., Ltd.	100	—	50	—
Clyde Estates Co., Ltd.	100	—	—	—
Doomoo Tea Co., of Ceylon Ltd.	100	—	67½	65
Drayton Estate Co., Ltd.	100	—	..	—
Eila Tea Co., of Ceylon, Ltd.	100	20	30	—
Estates Co of Uva, Ltd.	500	—	205XDIV	205XDIV
Gangawatte Tea Co., Ltd.	100	—	—	—
Glasgow Estate Co., Ltd.	500	—	945	..
Great Western Tea Co., Ltd.	500	610	—	—
Hapugahalande Tea Estate Co.	200	—	—	—
High Forests Estates Co., Ltd	500	450	500	450
Do part paid	400	—	...	—
Horrekelly Estates Co Ltd	100	—	80	—
Kalutara Co., Ltd.,	500	—	250	—
Kandyan Hills Co., Ltd.	100	—	45	—
Kanapediwatte Ltd.	100	—	85	—
Kelani Tea Garden Co., Ltd.	100	..	35	—
Kirklees Estate Co., Ltd.	100	...	50	—
Knavesmire Estates Co., Ltd.	100	—	50	..
Maha Uva Estates Co., Ltd.	500	—	350	...
Mocha Tea Co., of Ceylon, Ltd.	500	—	700	—
Nahavilla Estate Co., Ltd.	500	..	300	—
Nebeda Tea Co., Ltd.	500	—	500	—
Palmerston Tea Co., Ltd.	500	...	400	—
Penrhos Estates Co, Ltd.	100	...	90	—
Pitakanda Tea Company	500	—	...	—
Pine Hill Estate Co., Ltd.	60	...	40	—
Putupaula Tea Co., Ltd.	100	...	..	—
Ratwatte Cocoa Co., Ltd	500	.	—	—
Rayigam Tea Co., Ltd.	100	...	..	—
Roeberry Tea Co., Ltd.	100	70	...	—
Ruanwella Tea Co., Ltd.	100	..	40	—
St. Hellier's Tea Co., Ltd,	500	...	—	—
Talgaswela Tea Co., Ltd.	100	...	20	—
Do 7 per cent Prefs.	100	..	—	—
Tonacombe Estate Co., Ltd,	500	..	...	—
Udugama Tea & Timber Co., Ltd.	50	...	...	—
Union Estate Co., Ltd.	100	..	110	—
Upper Maskeliya Estates Co., Ltd.	500	..	—	500
Uvakellie Tea Co., of Ceylon, Ltd,	100	67½	—	67½
Vogan Tea Co., Ltd.,	100	..	47½	...
Wanarajah Tea Co., Ltd.	500	..	—	—
Yataderiya Tea Co., Ltd.	100	..	300	250

CEYLON COMMERCIAL COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transaction.
Adam's Peak Hotel Co., Ltd.	100	...	30	—
Bristol Hotel Co., Ltd.	100	—	110	—
Do 7 per cent Debts	100	107	—	—
Ceylon Gen. Steam Navgtn. Co., Ltd	100	—	225	—
Ceylon Superaeration Ltd.	100	—	45	—
Colombo Apothecaries' Co. Ltd.	100	142½	—	115
Colombo Assembly Rooms Co., Ltd	20	15	..	
Do prefs.	20	...	..	—
Colombo Fort Land and Building Co., Ltd.	100	—	85	—
Colombo Hotels Company	100	—	280	—
Galle Face Hotel Co., Ltd.	100	200	—	200XDIV
Kandy Hotels Co., Ltd.	100	...	..	117½
Mount Lavinia Hotel Co., Ltd.	500	—	300	—
New Colombo Ice Co., Ltd.	100	..	157½	—
Nuwara Eliya Hotels Co., Ltd.	30	—	30	—
Do 7 per cent prefs.	100	107	...	—
Public Hall Co., Ltd	20	12½	14	—

LONDON COMPANIES

Company	paid. p. sh.	Buyers.	Sellers.	Transaction.
Alliance Tea Co., of Ceylon, Ltd.	10	..	8—9	—
Anglo-Ceylon General Estates Co	100	...	55—60	—
Associated Estates Co., of Ceylon	10	..	1½—2½	—
Do. 6 per cent prefs.	10	..	3—5	—
Ceylon Proprietary Co.	1	.	¼—½	—
Ceylon Tea Plantation Co., Ltd.	10	..	23¼—24	—
Dimbula Valley Co., Ltd.	5	..	5—5½	—
Do prefs	5	—	5—6	—
Eastern Produce & Estates Co. Ltd.	5	3¼	3¼—3¾	—
Ederapolla Tea Co., Ltd	10	...	6—8	—
Imperial Tea Estates Co., Ltd.	10	4	4..4½	—
Kelani Valley Tea Assen., Ltd.	5	...	3—5	—
Kintyre Estates Co., Ltd.	10	...	6 8	—
Lanka Plantations Co., Ltd	10	..	4	—
Nahalma Estates Co., Ltd.	1	...	nom	..
New Dimbula Co., Ltd.	1	...	2¾—3	..
Nuwara Eliya Tea Estate Co., Ld.	10	—	9⅝	—
Ouvah Coffee Co., Ltd.	10	..	—7	—
Ragalla Tea Estates Co., Ltd.	10	.	11—13	—
Scottish Ceylon Tea Co., Ltd.	10	-	10—15	—
Spring Valley Tea Co., Ltd.	10	...	2—5	—
Standard Tea Co., Ltd.	6	..	10—12	..
The Shell Transport and Trading Company, Ltd.	1	...	2⅞—3⅓	..
Ukuwella Estates Co., Ltd.	25	—	par	—
Yatiyantota Ceylon Tea Co., Ltd.	10	—	5¼	..
Do. pref. 6 o/o	10		9—10	...

BY ORDER OF THE COMMITTEE.

Colombo, March 7th, 1902

* Latest London Prices.

RAINFALL RETURN FOR COLOMBO.

(*Supplied by the Surveyor-General.*)

	1897.	1898.	1899.	1900	Av of 32yrs.	1901	1902
	Inch	Inch	Inch.	Inch.	Inch.	Inch	Inch
January ..	3·81	2·32	6·98	3·72	3·24	11·91	1·95
February ..	1·68	1·98	2·78	0·63	1·89	3·55	4·57
March ..	3·66	4·21	0·88	3·71	4·75	5·12	0·37*
April ..	10·97	22·81	6·66	15·12	11·43	8·71	
May ..	8·30	5·80	17·73	10·63	12·04	6·28	
June ..	10·14	10·94	9·23	7·83	8·35	5·93	
July ..	5·24	6·15	1·11	6·77	4·30	4·52	
August ..	9·09	0·97	0·62	7·35	3·79	0·46	
September ..	4·58	6·90	1·48	4·00	4·93	3·93	
October ...	4·71	20·60	12·99	9·47	14·36	3·91	
November ..	11·66	17·38	8·58	9·25	12·55	19·84	
December ..	8·89	3-05	4·44	5·20	6·35	1·70*	
Total..	82·73	103·11	73·48	83·68	88·03	75·86	6·89

* From 1st to 5th March. 0·37 inch, that is up to 9·30 a.m on the 6th March —ED. *C.O.*

CEYLON TEA: MONTHLY SHIPMENTS TO UNITED KINGDOM AND ESTIMATE.

Estimate for	Feb.	1902—8 to 8½ mill.	lb.
Total Shipments	Do	1902—8,0[illegible],000	lb.
Do Do	Do	190[illegible]—8,383,266	lb.
Do Do	Do	1[illegible]—8,4[illegible],967	lb.

[ESTIMATE for Mar, 1902—8½ to 9 million lb.]

THE DEAF HEAR.—No. 479 of *the Illustrated World* of 626, Chiswick High Road, London, W., England contains a description of a remarkable Cure for Deafness and Head Noises which may be carried out at the patient's home, and which is said to be a certain cure. This number will be sent free to any deaf persons sending their address to the Editor.

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce)

EXPORTS

Colombo, March 3rd, 1902.

CARDAMOMS:—
All round parcel, well bleached per lb. R1·40
Do. dull medium do. R1·20
Special assortment, 0 and 1 only do. R1·60
Seeds do. R1·20

CINCHONA BARK:—
Per unit of Sulphate of Quinine 12c—1½ at 3 o/o

CINNAMON:—
Ordinary assortment per lb. 54c.
Nos. 1 and 2 only per lb. 60c.
Nos. 3 and 4 only per lb. 49c.

CINNAMON CHIPS:—
Per candy of 560 lb R72·50

COCOA:—
Finest estate red; unpicked per cwt R40·00 }
Medium do do R35·00 } No en-
Bright native unpicked and undried R32·50 } quiry
Ordinary do do do R25·00 }

COCONUTS—(husked).
Selected per thousand R62·00
Ordinary " R54·00
Smalls " R45·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R77·50
Do in bags None

COCONUT (Desiccated).
Assorted all grades per lb 23c

COCONUT OIL—
Dealers' Oil per cwt R19·00
Coconut Oil in ordinary packages f. o. b. per ton R425·00. Nominal

COFFEE.—
Plantation Estate Parchment on th spot per bus. R11·50
Plantation Estate Coffee f. o. b. (ready) per cwt.—None. No quotations
Native Coffee, f.o.b per cwt.—None. No quotations.

CITRONELLA OIL—
Ready do per lb.—48c

COPRA—
Boat Copra per candy of 560 lb. R62·50
Calpentyn Copra do do R63·00
Cart do do do R61·00
Estate do do do R62·50

CROTON SEED per cwt—R10·00

EBONY—
Sound per ton at Govt. depot—R190·00.
Inferior R125·00.—Next Sales 7th April.

FIBRES—
Coconut Bristle No 1 per cwt None
Do " 2 None
Do mattress " 1 None
Do " 2 None
Coir Yarn, Kogalla " 1 to 8 15·00 } a little
Do Colombo " 1 to 8 11·50 } firmer tone
Kitool all sizes None
Palmyrah None

PEPPER—Black per lb None

PLUMBAGO—
Large lumps per ton R600 }
Ordinary lumps do R550 }
Chips do R375 } Nominal, no
Dust do R225 } sellers.
Do (Flying) do R140 }

SAPANWOOD— per ton R40·00

SATINWOOD (ordinary) per cubic ft. R4·00
Do (Flowered) per cubic ft. R17·00

TEA—	High Grown Average.	Medium Average.	Low Grown Average.
Broken Pekoe and Broken	cts	cts	cts
Orange Pekoe per lb	54	47	37
Orange Pekoe do	56	43	35
Pekoe do	49	38	32
Pekoe Souchong do	36	33	29
Pekoe Fannings do	28	27	26
Broken mixed—dust, &c	22	21	21

CEYLON EXPORTS AND DISTRIBUTION FOR SEASONS 1901 AND 1902.

COUNTRIES	Black Tea. 1902 lbs.	Black Tea. 1901 lbs.	Green Tea. lbs.	Coffee—cwts. Plantation	Coffee—cwts. N'tive	Coffee—cwts. Total.	Cocoa cwts.	C'moms lbs.	Cinnamon Bales. lbs.	Cinnamon Chips. lbs.	Coconut Oil. 1902 cwt	Coconut Oil. 1901 cwts	Copra cwts.	Desiccated Coconut lb.	Poonac. cwts.	Coconuts. No.	Plumbago. 1902 cwts.	Plumbago. 1901 cwts.	Fibre cwts
U. K.	14966224	19348551	88860	747		747	8003	73423	55154	34259	15866	22911	1500	878546		1194580	30709	12851	6310
,, Austria	175	16365		1		1				11200	1701	772		15000		5000			
,, Belgium	8137	750					250		15600	30800		998	1970	51170	9058	49780	2256	218	2521
,, France	55418	49097							5800	5600			4389			34020			101
,, Germany	94074	44067					747	21789	88800	58314	1353		8777	11788	6228	125950	6863	7624	818
,, Holland	750	11074							2500	39200				16250					279
,, Italy	1760	1102					1	435	13600	47514	607				10	895			
,, Russia	1190219	727093		2		2							2000						
,, Spain	500	—							24900	11200									
,, Sweden	10755	12815					100					199							
,, Turkey	7573	9866																	
,, India	117030	329771		15		15		22122				6657				14400	1576	19	213
,, Australia	1735195	2110099		550		550	154		1800	3920	10785	35		99631			25		773
,, America	221857	410456	139812						25000	4315	499	6004		108025			17371	32111	315
,, Africa	70189	25084		2		2		1506						9050	1	153500			119
,, China	493808	245551		8		8	100	2183	200	112		254					637		87
,, Singapore	20727	11310		1		1	1976												
,, Mauritius	3100	7800																	
,, Malta	54750	85130																	
Total export from 1st Jan. to 3rd Mar. 1902	19052241	23445981	228672	1329	..	1326	11334	121458	238354	246464	30791	37330	18636	1273552	15297	1578125	59437	54795	11611

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Price Current, London, January 29th, 1902.)

	QUALITY.	QUOTATIONS
ALOES, Soccotrine cwt.	Fair to fine dry ..	70s a 80s
Zanzibar & Hepatic ,,	Common to good ..	20s a 60s
ARROWROOT (Natal) lb.	Fair to fine ..	5½d a 6¾d
BEES' WAX, cwt.		
Zanzibar & Bombay White ,,	Good to fine	£6 a £7 10s
Zanzibar & Bombay Yellow ,,	Fair ,,	£6 a £6 12s 6d
Madagascar ,,	Dark to good palish	£6 a £6 10s
CAMPHOR, Formosa ,,	Crude and semi-refined	165s a 185s
Japan ,,	Fair average quality ..	175s a 180s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	1s 9d a 2s 2d
	Middling, stalky & lean	1s 3d a 1s 7d
Ceylon. Mysore ,,	Fair to fine plump ..	1s 4d a 3s 8d
	Seeds ..	1s 11d a 2s 3d
,, Tellicherry ,,	Good to fine ..	2s 6d a 3s
	Brownish ..	1s 6d a 2s
,, Long ,,	Shelly to good ..	1s 6d a 3s
,, Mangalore ,,	Med brown to good bold	2s 3d a 3s 3d
CASTOR OIL, Calcutta ,,	1sts and 2nds ..	3¼d a 3½d
CHILLIES, Zanzibar cwt.	Dull to fine bright ...	32s 6d a 40s
CINCHONA BARK.– lb.	Ledgeriana Orig. Stem	3d a 5½d
Ceylon	Crown, Renewed	5d a 7d
	Org. Stem	3¾d a 5½d
	Red Org. Stem	3⅜d a 4¼d
	Renewed	3d a 5¾d
	Root	3¾d a 4d
CINNAMON, Ceylon 1sts	Ordinary to fine quill	9½d a 1s 6d
per lb 2nds	,, ,,	8½d a 1s 5d
3rds	,, ,,	8½d a 1s 4d
4ths	,, ,,	8d a 11d
Chips	,, ,,	2½d a 10d
CLOVES, Penang lb.	Dull to fine bright bold	4½d a 9½d
Amboyna ..	Dull to fine	5d a 6d
Zanzibar and Pemba	Good and fine bright	4⅛d a 4½d
	Common dull to fair	3⅜d a 4 1-16d
Stems ..	Fair	1⅝d
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	92s 6d a 120s
	Middling to fine mid ..	80s a 103s
	Low mid. and low grown	
	Smalls	40s a 60s
Native	Good ordinary	40s a 55s
Liberian ,,	Small to bold	3 s a 40s
COCOA, Ceylon ,	Bold to fine bold	67s 6d a 90s
	Medium and fair	60s a 66s
	Native	52s 6d a 62s 6d
COLOMBO ROOT ,,	Middling to good	7s a 14s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair ..	£13 10s a £18
FIBRE, Brush ,	Ord. to fine long straight	£16 a £19
Cochin ,,	Ordinary to good clean	£20 a £21
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £30
Cochin ,,	,, ,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	15s a 20s
CUTCH ,, ,,	Fair to fine dry	23s a 35s
GINGER, Bengal, rough,,	Fair	40s
Calicut, Cut A ,,	Good to fine bold	90s a 100s
B & C ,,	Small and medium	55s a 80s
Cochin Rough ,,	Common to fine bold	45s a 52s
	Small and D's	40s a 44s
Japan ,,	Unsplit	40s a 42s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	15s a 45s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £18
	Part yellow and mixed	£7 a £9
	Bean and Pea size ditto	70s a £9 2s 6d
	Amber and dk. red bold	£5 10s a £6 7s 6d
	Med. & bold glassy sorts	80s a 120s
Madagascar ,,	Fair to good palish ...	£4 a £8
	,, ,, red ...	£4 5s a £7 10s
ARABIC E. I. & Aden ,,	Ordinary to good pale	35s a 58s
Turkey sorts ,,		35s a 40s
Ghatti ,,	Pickings to fine pale ...	12s 6d a 35s
Kurrachee ,,	Good and fine pale ...	40s a 45s
	Reddish to pale selected	30s a 35s
Madras ,,	Dark to fine pale ...	20s a 35s
ASSAFŒTIDA ,,	Clean fr. to gd. almonds	60s a 137s 6d
	Ord. stony and blocky	6s a 25s
KINO ,,	Fine bright	1s 3d
MYRRH, picked ,,	Fair to fine pale	80s a 115s
Aden sorts ,,	Middling to good	50s a 70s
OLIBANUM, drop ,,	Good to fine white	35s a 55s
	Middling to fair	25s a 35s
pickings ,,	Low to good palo	18s a 23s
siftings ,,	Slightly foul to fine	18s a 22s
INDIARUBBER, Assam lb	Good to fine	2s a 2s 3d
	Common to foul & mxd.	7d a 1s 6d
Rangoon	Fair to good clean ...	2s a 2s 4d
Borneo	Common to fine	1s a 2s

	QUALITY.	QUOTATION.
INDIARUBBER (contd.)		
Java, Sing. & Penang lb.	Foul to good clean ...	8d a 2s 3d
Mozambique ,,	Good to fine Ball ...	2s 6d a 3s
	Ordinary to fair Ball ...	1s 10d a 2s 4d
	Low sandy Ball ...	1s 3d a 1s 6d
	Sausage, fair to good ..	2s a 2s 9d
	Liver and Livery Ball ..	1s 9d a 2s 6d
Nyassaland	Fair to fine ball ..	2s 2d a 2s 9d
Madagascar	Fr to fine pinky & white	2s a 2s 5½d
	Fair to good black ..	1s 3d a 1s 9d
	Niggers, low to fine ..	7d a 2s
INDIGO, E.I.	Bengal—	
	Shipping mid to gd violet	3s 4d a 4s
	Consuming mid. to gd.	3s a 3s 3d
	Ordinary to mid.	2s 10d a 3s
	Mid. to good Kurpah	1s 6d a 2s 1d
	Low to ordinary	1s a 1s 5d
	Mid. to good Madra	1s 10d a 2s 3d
MACE, Bombay & Penang	Pale reddish to fine	2s a 3s
per lb.	Ordinary to fair	1s 4d a 1s 11d
	Pickings	1s 3d a 1s 4d
MYRABOLANS, Madras cwt	Dark to fine pale UG	5s a 6s
	Fair Coast	4s 6d a 4s 9d
Bombay ,,	Jubblepore	5s a 6s
	Bhimlies	4s 3d a 7s
	Rhajpore, &c.	4s a 5s 9d
Bengal ,,	Calcutta	3s 6d a 5s
NUTMEGS— lb.	64's to 57's	2s 4d a 2s 6d
Bombay & Penang ,,	110's to 65's	1s 1d a 2s 4d
	160's to 130's	6d a 1s
NUTS, ARECA cwt.	Ordinary to fair fresh	30s a 50s
NUX VOMICA, Bombay	Ordinary to middling	4s a 5s 6d
per cwt. Madras	Fair to good bold fresh	7s a 10s 6d
	Small ordinary and fair	5s a 6s 9d
OIL OF ANISEED ,,	Fair merchantable	5s
CASSIA ,,	According to analysis	2s 7d a 2s 9d
LEMONGRASS ,,	Good flavour & colour	6d a 6¼d
NUTMEG ,,	Dingy to white	1½d a 3d
CINNAMON ,,	Ordinary to fair sweet	3¼d a 1s 6d
CITRONELLE ,,	Bright & good flavour	9½d a 10d
ORCHELLA WEED—cwt.		
Ceylon ,,	Mid. to fine not woody .	10s a 12s 6d
Zanzibar. ,,	Picked clean flat leaf ..	10s a 14s
	,, wiry Mozambique	10s a 11s
PEPPER - (Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ...	6d a 6¼d
Singapore ...	Fair	6 1-16d
Acheen & W. C. Penang	Dull to fine	5¾d a 6⅛d
PLUMBAGO, lump cwt.	Fair to fine bright bold	30s a 35s
	Middling to good small	20s a 32s
chips	Dull to fine bright ..	9s a 15s
dust	Ordinary to fine bright	3s 6d a 8s
SAFFLOWER	Good to fine pinky ..	65s a 75s
	Inferior to fair .	40s a 60s
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£20 a £50
Chips ,,	... ...	5s a £8
Madras, Logs ,,	Fair to good flavour ..	£20 a £50
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Ceylon ,,	Fair to good ..	£5 a £5 10s
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth ...	£7
SEEDLAC cwt.	Ord. dusty to gd. soluble	105s a 110s
SENNA, Tinnevelly lb.	Good to fine bold green	5d a 1s 0¼d
	Fair greenish	3½d a 4¾d
	Common dark and small	1d a 3d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's, D's and B's, Small ...	£1 a £5 10s
Mergui ,,	Small to bold ..	£6 7s 6d a £6 15s
Mussel ,,	Small to bold ...	22s a 55s
TAMARINDS, Calcutta...	Mid. to fine bl'k not stony	8s a 10s
per cwt. Madras	Stony and inferior ..	4s 6d a 6s
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	16s a 22s 6d
TURMERIC, Bengal cwt.	Fair ...	16s a 17s
Madras ,,	Finger fair to fine bold bright	16s a 23s
Do. ,,	Bulbs ..	14s a 18s
Cochin ,,	Finger ..	17s 6d a 18s
	Bulbs ...	12s 6d
VANILLOES— lb.		
Mauritius ... 1sts	Gd. crysallized 3½ a 9 in	5s a 23s 6d
Bourbon ... 2nds	Foxy & reddish 3½ a 8 ,,	4s a 11s
Seychelles 3rds	Lean and inferior ...	2s a 6s
VERMILION lb.	Fine, pure, bright ...	3s 2d a 3s 3d
WAX, Japan, squares cwt.	Good white hard ...	35s a 36s

THE
AGRICULTURAL MAGAZINE,
COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for March :—

Vol. XIII.] MARCH, 1902. [No. 9.

VALUE OF SOIL ANALYSIS.

WE have been much struck by the blind faith which people place in soil analysis, relying upon it as a mysterious "open sesame" to the secrets of Nature as she works through plant and soil. The fact is that the old method of soil analysis as it is ordinarily understood by laymen has come to be discredited long ago since.

If we consider for a moment what a soil analysis is generally expected to tell us, we shall see how presumptive are the claims of the chemist who takes credit for being able to give us this information by his manipulations in the laboratory.

How is it supposed that the chemist can recognise the subtle relation between the vital forces in the plant and the soil in carrying out his analyses, with a view to telling you what has to be added to the soil to meet the requirements of the plant? Does he make allowance for the capacity in plants to attack and appropriate the ingredients of plant food in the different forms in which they occur in the soil, and for the differences in his capacity in different plants? The solvent medium adopted in reckoning the proportion of "available" plant food in the soil has always been an uncertain factor in soil analysis, which has shifted its ground more than once with a view to reaching more accurate results.

The recognised action and interference of soil bacteria in the preparation of plant food has only helped to further complicate the difficulties of the agricultural chemist and the uncertainty of chemical analysis as a gauge of the fertility of soils. The "outside influences" in the preparation and appropriation of plant food in the soil are so important that the mere treatment of soil by purely chemical methods gives very imperfect and runeliable results. Indeed the biological action that takes place in the soil has come to be admitted to be as important, if not more important, than the chemical. So that the analytica, chemist, if he is to give us accurate information as regards the fertility of our soils and the requirements of plants growing in them, must widen his scope of operations to a considerable extent, and tot he best of his ability, take cognisance of the vital action exercised by the plant and the bacterial activity within the soil—forces, it must be admitted, that can hardly be estimated at their full value in the laboratory. It would seem therefore, that apart from his purely technical qualifications in science as a chemist would need to have a considerable practical experience of soils and manures, and a large endowment of common sense—on which indeed he has to rely to a great extent in drawing his conclusions as to the properties and requirements of particular soils.

We were only last week discussing this subject with an eminent agricultural authority who passed through the Island on his way to take up an important appointment in the Antipodes, and were much impressed with his strong condemnation of the reliance placed by some on the results of chemical analyses. Such people think it is enough for them to send a sample of soil to a chemist with a note saying, "Please analyse the accompanying sample and let me know what

manure I should supply." The ignorance displayed by such a bare request is only surpassed by the audacity of the reply prescribing the kind of manure to be used.

And even when all things are considered: the past history and present circumstances of soil and plant, mechanical properties, the question of rainfall, drainage, etc., etc., we still cannot with anything like exactitude calculate upon certain treatment producing certain results, unless our recommendations are based upon the outcome of actual experiment and personal experience—our best guides. A contemporary well sums up the situation we are discussing as follows:—

Many farmers hold erroneous ideas as to the value of soil analyses. We hear farmers speaking as though they only required to have the soil analysed to know what manures to apply to certain crops to obtain the best returns. This, however, is far from being so. In the first case, as every farmer knows, it would be nearly impossible to obtain a sample that would fairly represent even a ten-acre field. Besides this, an analysis will only show what the soil contains; it will not tell the farmer whether the plant food is in such a condition that the plants can make use of it, neither will it tell him what treatment the soil requires to make that plant food available. So many other things, such as the physical condition of the soil and subsoil, its ability to retain moisture or perhaps the reverse, have to be taken into consideration that (except to the scientist) a soil analysis is just as likely as not to prove misleading in dealing with the manures such a soil requires. The only guide to the farmer is experience. Find out what others have done under similar conditions, and prove by experiment whether the treatment beneficial in their case is equally so in yours.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF FEBRUARY, 1902.

1	Saturday ..	Nil	15	Saturday ..	·50
2	Sunday ..	Nil	16	Sunday ...	Nil
3	Monday ...	Nil	17	Monday ...	Nil
4	Tuesday ...	·02	18	Tuesday ...	Nil
5	Wednesday ..	Nil	19	Wednesday...	2·54
6	Thursday ...	Nil	20	Thursday ...	Nil
7	Friday ..	Nil	21	Friday ...	Nil
8	Saturday ..	Nil	22	Saturday ...	Nil
9	Sunday ..	Nil	23	Sunday ...	Nil
10	Monday ...	·12	24	Monday ...	Nil
11	Tuesday ...	·04	25	Tuesday ..	Nil
12	Wednesday ..	1·88	26	Wednesday...	Nil
13	Thursday ...	Nil	27	Thursday ..	Nil
14	Friday ...	·20	28	Friday ...	Nil
				Total...	5·30
				Mean...	·19

Greatest amount of rainfall registered in any 24 hours on the 19th inst., 1901, 2·54 inches.

Recorded by ALEX. PERERA.

OCCASIONAL NOTES.

Mr. Williamson Wallace, the late Lecturer on Agriculture at the Heriot-Watt Technical College, Edinburgh, and subsequently Director of Agriculture, Cairo, was a visitor at the School of Agriculture, Colombo, last week. Mr. Wallace was on his way to Melbourne to assume the duties of the new Director of Agriculture for Victoria—an appointment about which so much has been heard of late through the press. Our personal acquaintance with Mr. Wallace commenced in 1886, when we placed ourselves under his tutorship for a practical knowledge of Agriculture on his 2,000-acre farm "Twiglees" near Locherbie in Dumfries-shire. Mr. Wallace, we were glad to find, is in excellent health and full of enthusiasm over the prospect of his new duties which will offer a wide scope for his scientific and practical attainments.

The specific gravity of coconut oil is, at 99° C, 873·6, its solidifying point varies from 68° to 82° F., iodine value 8·7, Reichert-Meissl value 7·5, and Butyro-refractometer value 35·5 at 40° C. In its natural state coconut oil readily becomes rancid, though the thoroughly purified forms are free from this defect. Messrs. Loders and Nucoline, Limited, adopt the following process in purifying the crude coconut oil. After heating to a vacuum, a current of low pressure steam is forced through, which carries off the volatile substances of objectionable or pronounced odour or flavour, and leaves behind a pure and comparatively neutral fat. Like lards these preparations are pure fats and contain no foreign matter. They are distinguished from other fats, both vegetable and animal, by possessing a rather high Reichert-Meissl value. We understand that the latest developement in the preparation of pure vegetable fat from the coconut is a process by which the fat is mechanically liberated from the fresh nut without any previous dessication. The samples produced by this process are unequalled in purity and freshness, and lead one to expect that the product will meet with ready demand from confectioners.

A Planter, who has given much attention to the subject of manuring the coconut, affirms that the results of fertilising the palm show themselves not only in increased vigour in the tree and larger crops, but also in greater developement of the kernel. He believes that by manuring the number of nuts required for a candy (650 lbs) of Copra can be reduced from, say, 1,100 in the case of good nuts to 1,000 or even 950.

NATURE TEACHING IN SCHOOLS.

In a report on "Popular Education for the Farmer" by Dr. True, Director of Experimental Stations, U.S., the following reference to the above subject occurs:—

"There is evry reascn to believe that the plan of 'nature teaching,' as proposed by Cornell

University, may prove a grand success and be of very great benefit to farmers' children. The element of education which is at present most lacking in our common schools is the training of the powers of observation. The children need above all things else to be taught to observe carefully and correctly, and to state their observations in clear and terse language. The ordinary child, whether on the farm or in the town, actually sees comparatively little in the world about him. The wonders of the trees and plants in park or meadow, of birds and insects flying about the house, float like shadowy visions before his eyes. 'Seeing, he sees not.' He needs a teacher who can open his eyes and fix his mind on the relalities among which his daily life is passed. This accurate observation of natural objects and facts is the only foundation on which scientific attainments can rest. The scientist is chiefly a man who sees better than his fellow men. But it is also a great help in practical life. Many farmers acquire much of this power by their own unaided efforts. And these are the very men who most regret that they did not have in early life the help of a trained teacher. The farmer's child lives where he has the best opportunity for such training. It would benefit him in the practice of his art, and it would add an interest to his life which would do much to wean him from a desire to leave the farm for the turmoil and uncertain struggles of the town. With proper provision for the training of teachers in normal and other schools, it would be entirely feasible to have this nature teaching in all our common schools within a few years. It is such teaching that the child-mind craves. With it the school becomes a delightful place and the teacher an angel of light. The leaflets which the College of Agriculture of Cornell University is issuing show how vitally this nature teaching may be made to affect agriculture, though it is not in itself the teaching of agriculture. In one leaflet the teacher is instructed to have the children plant squash seeds, dig some of them up at intervals to learn how the seeds germinate. and watch what happens to the little plants as they push their way up through the soil and unfold their stems and leaves in the air. Four apple twigs form the subject of some other lessons, and it is wonderfull how much a child can learn about the way trees go from such simple materials. At another time the children are encouraged to plant little gardens and carefully watch some of the things which grow in them. Or they study some insect which]reys upon fruit or make collections of the insects about their homes, or watch them to see whether they are doing things good or bad for the farmer.

"Is it not likely that a child who is thus taught will soon begin to see a new value and dignity in farm life, and to be less envious of the boy or girl who is shut up within the narrow confines of city streets most of the year? And if the farmer's boy learns how to accurately observe the processes of nature with which farm practice deals and the foes with which agriculture has to contend, are not the chances vastly increased that he will be successful in managing nature so as to get the greatest favours from this coy mistress of his life and fortune?"

Commenting on the above the *Agricultural Gazette* of New South Wales says :—

In Canada the question has excited the liveliest interest among the Farmers' Institute and Departmental authorities. In expressing his opinion of the idea of nature] teaching, the Director of Teachers' Institutes (Mr. W. Houston. M.A.) says that very little consideration is necessary to show that of all forms of "nature study" agriculture is the best for stimulating a spirit of intelligent inquiry in the minds of children. The pupil cannot be made "learned" in the scientific sense, but he can secure a wide and useful acquaintance with the theory of agriculture, if his teachers know how to put him in possession of it. Mr. Houston inclines to the opinion that so far as imparting elementary instruction is concerned, the lack of systematic training in agricultural subjects is not likely to prove a very formidable obstacle in the way of teachers.

Indeed, on every side there is evidence of a desire on the part of school-teachers to encourage the childeren in the study of agricultural matters, and despite the difficulties that seems to be in the way of anything like a definite and comprehensive scheme of elementary agricultural instruction in the State schools (such, for instance, as that of France, where instruction in agriculture is compulsory at every primary school), there is every prospect of good work in this direction being effected. The field of agriculture is so wide that both teacher and pupil may find relief in the diversity of subjects, and, as Mr. Guthrie pointed out when writing on this subject some time ago, it is in "training in scientific method, in habits of exact obser vation and careful reasoning, rather than the amassing of facts and theories that best results can be attained."

THE CHOCHO [SECHIUM EDULE].

The Government Botanist at the Cape contributes an interesting account of the Christophine or Chayote, a vegetable familiar enough in Ceylon, more especially the Central Province, under the name of "Chocho." According to a reliable authority the last name is the correct one, and "Chayote" is only a nigger conception of it. Chocho, described as "a squash which is not exactly a squash but something far better," has apparently established itself as a standard vegetable in America and even in Europe, for we read of Algeria already forwarding hundreds of tons of the fruits to Paris and London as a special winter vegetable; while it has begun to become popular in the Southern Colonies. Referring to the shyness among people to accept a new vegetable, Mr. MacOwan quaintly explains the condition of mind thus: I dare say if we had on record the primæval history of the Cabbage or of the Turnip we should find that the man who first grew and ate these

esculent novelties was similarly disappointed when he pressed them upon the attention of his prehistoric neighbours. They no doubt asked why they should venture to eat such new-fangled stuff when there was such an abundance of acorns to be had—a food which had stood the test of centuries and had been eaten by their forefathers from time immemorial! It would not be necessary to reproduce the description of the plant and the method of cultivating it, but we would like to impress upon our readers the value of the Chocho as a vegetable, and the advantages of cultivating it regularly in our gardens. Single vines will produce as much as 300 fruits, of an average weight of 8 ounces each, but the ordinary yield when grown on a large scale as in Algeria may be put down at 25 to 100 fruits per plant. The tuber ("as large as a man's head") formed after the first season is edible and somewhat resembles a yam in character, twenty per cent of its bulk consisting of small-grained starch like that of wheat. These roots which in appearance are like the larger sorts of Cassava are commonly sold together with the fruits in Mexico.

We quote as follows regarding the edible properties of the Chocho :—"Very different opinions as to the value of the chayote for food have been expressed. some writers reporting it to be insipid, while others have compared it to the vegetable marrow and have pronounced it superior thereto. The whole controversy is a question of cuisine, or one may say, of the sauce in which the vegetable is presented. Eggs without salt, beef without mustard, and salad without vinegar might just as rightfully be condemned on the ground of insipidity. Of course the fruit must be taken for the table when young; the old fully grown ones, like all similar vegetables, are more or less stringy and tough. Whatever can be done with the best summer squashes may be done to better account with the chayote. In Jamaica it is often treated as a fruit rather than a vegetable accompaniment to roast or boiled meat, and is converted into puddings or tarts with sugar and lime-juice even as apples are used. Since there is a greater variety of fruits than there is of vegetables, this custom seems to be a mistake. Dr. Trabut believes that as soon as its table merits are known it will become a general favourite and appear to much the same good purpose as sea-kale, asparagus, artichoke and the like. He says that before any special preparation it should be kept in boiling water for about an hour. [Young fruits are sufficiently boiled in about 40 minutes.] The leathery skin can be detached easily and the vegetable shows a white flesh like that of a boiled turnip or knol-kohl. It may then be cut in slices and sent up with any suitable kinds of sauces just as is done with the small squash."

Some time ago it was supposed that the Chocho possessed noxious properties, and that people partaking of it as a regular diet were afflicted with a disorder resembling rheumatism. Mr. Nock, Superintendent of the Hakgala Gardens, (who we believe introduced the fruit to Ceylon) contradicted so absurd a notion in a report at present we have no access to. It is sufficient guarantee, we presume, of the wholesome character of the Chocho that it has been so largely and so long consumed in the West Indies and Mexico, and is now finding accceptence in Europe; but, as Mr. Mac Owan puts it, "Seeing that reiteration is accepted as a sort of argument, and that if you mean to push your produce you must keep on bawling out its virtues till the public catches on and listens." We reproduce the above notes in the hope that our readers may begin to see the value of the vegetable variously known as Christohpine, Chayote, Chocho, Tazoti and Mirliton in different parts of the world.

POULTRY CLIPPINGS.
(FROM VARIOUS SOURCES.)

One of the best materials that a poultryman can use for supplying the requisite lime is oyster shell, or any other variety of shells. An experiment in this direction was made at the New York experiment station, and the result was such that the use of oyster shells during the laying season, where they can be cheaply obtained, was strongly recommended. It was found there that one pound of oyster shells contained sufficient lime for the shells of about seven dozen eggs. Shells are not the only source for the lime necessary for egg shells. Bones also contain a large percentage of lime, as is seen from the following analysis of clean dry bones of oxen and sheep :—Carbonate of lime, six to seven per cent; phosphate of lime, fifty-eight to sixty-three per cent; phosphate of magnesia, one to two per cent; fluoride of calcium, two per cent; organic matter, twenty-five to thirty per cent. Fresh green bones also contain, besides the lime compounds, some protein or flesh formers, which add to its value as a poultry food. The best way to render the bones available is to have them broken by means of the bone-cutter.

A correspondent in "Farm Poultry" gives an ingenious device for freeing laying hens of lice, after having used many other methods and failed. His plan was :—Take an ordinary common-sized cotton clothes line; unbraid it so that it will make one-third or half when flattened out; cut in pieces about 12 in. long, and wind each once around the roost, letting the two ends pass down into the neck of a bottle about two-thirds full of kerosene, the bottle being suspended from the roof by a string fastened around the neck. The clothes line acts like a wick, drawing the oil up out of the bottle, and it being saturated with the oil, no louse can help coming in contact with it when he attempts to go to the hen at night, or when he leaves her in the morning. Hens with scaly feet and legs are also soon cured of their trouble when this method is used. Bottles can be suspended three or four feet apart on the roosts.

Chickens should be fed every couple of hours for the first week, four to five times the second and third weeks, *gradually* reducing the number of meals till you get them down to the old bird's meal times—twice a day. To be successful with young chickens, they should be fed often, and a little at a time; it is bad management, and waste of food if more is given than they eat up clean.

You could keep 250 to 300 hens to the acre if you divided the acre and penned them properly. It is not good management to run more than 25 to 30 hens together, and then the room given should be large enough for that number. Much depends on the breed which you intend to keep; if of the Leghorn class one rooster to ten or twelve hens would be about correct, if of the heavier breeds such as Brahmas, one rooster to six or eight hens. If you intend to produce eggs only, you do not require any roosters with the hens. On the other hand, if you wish to rear chickens, you should use good healthy roosters.

Try to keep the temperature of an incubator as near 103° as possible—of course, the last few days of the hatch, I don't mind it going up to 105°. A Foster Mother or Brooder should be heated to a temperature of 90° or 95° *when the chickens are in it*—not 90° and then run the chickens in to the Brooder. You must remember that the body heat of 60 or 70 chicks means a few degrees when they are shut up.

Never feed whole grain in a trough or feed-box. When so fed, there will be domineering hens which will get more than their share, but when the grain is scattered each hen must seek her portion and all have an equal chance. You need not fear to scatter it over every square yard of ground, for not a grain will be wasted, and it compels the hens to work. All penned fowls should have their grain food placed under straw, or some kind of a litter, so that they will exercise themselves in scratching for the grain.

Poultry can be bred for high records of eggs, just as dairy cows are bred for high butter records. We have many good layers, and some in these breeds are better than others. If we select high record hens that are good all-the-year-round layers, and breed along that line, we can add an extra dozen eggs to each hen for the year, then that will be profit. By carefully selecting the pullets for layers from the best laying hens, our egg-gathering is increased each year, which also means a larger profit each year. The cockerels used for breeding purposes should be selected from good laying hens as well as the pullets. For, it would be bad management to select the female line only, we must have the male line as carefully attended to if we wish to be successful in building up a record egg-producing breed.

The best breed is the one you have tested and tried as the one best adapted to your district and your purpose. There is no *best breed* that is best for all purposes, and for all climates; remember, that a breed has only one dominant talent and seldom excels more than one single characteristic. To a very large extent each poultty farmer must determine for himself which is the best breed—well—the best breed for his purpose, and the one most profitable to keep in his district. A breed may approach perfection in some districts, and give very little profit when kept in other localities. The influence of the climate often has much to do with the selection of the breed. With all the advantages in favour of a breed for prolificacy, hardiness is always essential to success, otherwise, loss and disease may mcre than balance the gain in other essentials.

VEGETABLES:

HOW TO COOK AND SERVE THEM.

Vegetables may be plainly boiled, or cooked and served up in some fancy way. In the former, just as much as in the latter case, they require careful attention; it is a common but very serious mistake to suppose they can be left to themselves, or to the tender mercies of chance. The average servant and—dare I say it? also the average mistress as well, puts down her vegetables to cook when she thinks of it, and they are either very much over-down when the time comes for serving or as hard as stones.

Now, of course, I know if the dinner hour is not punctual the cook cannot be expected to have her vegetables, or, indeed, any part of her dinner, very nice. But where there is a fixed time for dining, and the members of the family keep strictly to it, there is no excuse whatever.

The time required for cooking each vegetable should be carefully calculated, also the time for cleansing and preparing it; this latter, however, may be done with advantage some time, even hours, beforehand, and the vegetable be either set over or left in cold water, according to its nature.

In cases where it is really quite impossible for punctuality to be observed at meals—and I am quite willing to allow there are such, as in the case of a doctor, for instance—I would recommend the adoption of the following plan. In large high-class households, as most of us are aware, there is an utensil called a bain-marie, which is used for the purpose of keeping hot sauces, gravies, or any dish which the cook has been obliged to complete before it is required. What is this bain-marie? A large, shallow, open saucepan or kettle of nearly boiling water, into which the smaller vessels can be placed, thereby keeping them hot without altering their quality or quantity. Doubtless this bain-marie is expensive to buy, but what I am about to suggest is a substitute in the shape of a deep dripping pan, which can be set on side of kitchener or gas stove, and partly filled with nearly boiling water.

The potato, of course, is our principal vegetable, and if one can cook it well it is a good test of

talent in cooking. Not that it is so very difficult; it just requires a little care, that is all, and the remembrance of just a few simple rules. Old potatoes are placed in *cold* water, *new* ones in boiling water; some old potatoes are best steamed, some best boiled. If boiled in their jackets, as some prefer, they will not be so good a colour as if peeled first. To boil old potatoes, first scrub them clean in lukewarm water; they must be quite free from dirt before you begin to peel them, or they will stain. Peel them very thinly, as the most nourishing part lies next the skin, and it is a sin to waste it. As they are peeled throw them into a basin of clean cold water, where they may stay until wanted for boiling—an hour or longer will not matter. Place them in the saucepan with only sufficient water to cover them, and a good table-spoonful of salt to each two quarts of water. Bring them to the boil and boil gently, so that they may not break, for half hour strain off the water, and let them stand by fire or in a warm place, with the lid of the saucepan half off, for 5 minutes, when they should be perfectly dry and like balls of flour. Some kinds are better if drained from the water after 20 minutes cooking and allowed to finish in their own steam with the lid of saucepan on; then, when quite soft, partly remove the lid and let them dry as before. Now, if required to be kept hot any length of time, they can be placed in the hot water bath; but here is a wrinkle which everybody should take—if they have been boiled in an iron saucepan they must be removed into another vessel, or they will be almost sure to turn black. It is, perhaps, a safer plan to boil potatoes in an enamelled saucepan; then there will be no difficulty in keeping them a good colour, and this saucepan can be placed in the hot water bath with the lid partly off, until the potatoes are required for serving. It is obvious that only potatoes of equal sizes should be boiled together, as small ones would be tender while large ones were still hard. To steam tomatoes, simply place them in the steamer, sprinkle a little salt over them, and keep the water boiling in the saucepan beneath. Rather more than half an hour may be allowed, and they will not be so likely to spoil if cooked over time by this method of cooking. New potatoes are well washed and scraped, placed in cold water for a short time to preserve their colour, then into fast-boiling water salted in proportion, and with a sprig of mint to give them an agreeable flavour. They will probably be tender in 20 minutes, which may be ascertained by trying them with a skewer. When nearly so, strain off the water, let them finish cooking in their own steam, and dry them like old ones. Baked potatoes must be well scrubbed, and placed in a moderate oven; large ones should be chosen, and they will take from ¾ to 1 hour to become soft. It is easy to tell when they are done, by taking them in a cloth and squeezing them with the hands. All kinds of cooked potatoes are best taken to table uncovered; if necessary to keep the heat in, use a folded cloth in preference to the vegetable cover, as it will absorb the steam, and the potatoes will be less likely to be heavy. Some people have a great partiality for mashed potatoes, and there is a little instrument, called a potato masher, which does the work very nicely, making the flakes of potato fall lightly, and effectually removing all lumps. Care must be taken, however, to make it very hot before using and to mash the potatoes in a warm place, or they will be hopelessly cold and heavy. Perhaps the better plan is to turn them to the saucepan after mashing, and to stir them lightly over the fire, with a bit of butter or a little milk, until they are smoking hot again.

Greens, quite contrary to potatoes, require very fast boiling in an uncovered saucepan. By greens, I include all green vegetables, from cabbages to turnip-tops. They require very careful washing, both to remove the grittiness which some of them acquire and the insects which may cling to them in some of their crevices. To remove the latter, a good plan is to lay the vegetables in strong salt and water for 10 minutes or longer; the insects, if any, will then generally crawl out of their own accord, not liking a salt-water bath.

To boil a fresh young summer cabbage: Cut off the outside leaves and part of the stalk, and, if a large one, cut in quarters; if small, merely slit the stalk down a couple of inches in two places. Wash well in fresh water, then leave it in the salt water as recommended. Have ready a large saucepan with plenty of fast-boiling water, well salted in the proportion of a heaped table-spoonful of salt to every half-gallon of water, and, unless the cabbage is very young and freshly gathered, a bit of soda about the size of half a bean. After the water boils again upon the insertion of the cabbage, allow ¼ hour; then try it with a skewer; if not quite tender at the stalk, it will most likely require another 5 minutes; but as soon as ever it is done, take it up, place in a colander, and thoroughly drain from the water, for nothing is more objectionable than wet cabbage. Serve in a very hot vegetable dish, and, for the convenience of helping, cut it across once or twice. There should always be a drainer at the bottom of vegetable dish, for this and all green vegetables, as very possibly after the most careful straining there will still be a little moisture left.

To boil cauliflowers requires a little more care in order not to break the flower, and yet to have them quite tender. Wash and prepare them like cabbage, but they should never be cut up, unless, indeed, they are so close that they cannot be cleansed properly in any other way. Leave them in salted water for a time before cooking, place them in boiling water, with the head *downwards* in the saucepan—the reason for this is that should any scum rise on the water it will not discolour the flower if turned this way. Boil from 20 minutes to ½ hour, according to size; when the stalk feels tender upon the insertion of a skewer, the rest is sure to be done, as this is the hardest part, and takes longest to cook.

Cut greens of any kind are cooked in the same way, a tiny piece of soda in the water helps to keep their colour and to make them boil tender; but too much of this is very objectionable, as it makes the vegetables boil to a mash, and renders them unwholesome. Greens should be well drained from the water, and afterwards may be placed with advantage between two plates and well

squeezed from any remaining moisture. Or a plate (hot, of course) may be laid upon them on the top of the colander, and pushed down, when the water, if any, will run out.

French and Kidney beans come in when peas go out, and are a nice change to eat with any kind of hot meat. They are prepared by cutting off the heads and tails, and the thin string at the sides, and then by cutting into thin strips. As these are done they should be dropped into cold water, slightly salted. Place in boiling water, salted as for other vegetables, with a tiny piece of soda to keep them green, and boil 20 minutes. When tender they will sink to bottom of saucepan. Take them up, drain in a colander, and serve piled high in a dish, covered melted butter.

(*To be concluded.*)

NEW CURE FOR FOOT AND MOUTH DISEASE.

The correspondent at Rome of the London *Times*, writing to that paper on the 12th of November, said:—"The Italian War office is stated to have addressed a circular to the veterinary officers of the Italian Army recommending to their attention the new treatment of foot and mouth disease (by injections of a solution of corrosive sublimate) recently announced by Professor Guido, Baccelli, Minister for Agriculture and Commerce. The circular is understood to give directions for the preparation and use of the solution, and to recommend the greatest care in observing the effects of the new remedy. Pending the publication of this circular, which may be regarded as an official recognition of the efficacy of the corrosive sublimate treatment for foot and mouth disease, the following data may be of interest. They are furnished by Dr. Remo Guzzi, a young Lombard physician, who appears to have been the initiator of the remedy, first brought by him to the notice of the Pavia Medical Faculty in a special thesis last July after the completion of satisfactory experiments upon his own cattle. The solution used by him was composed of one gramme of corrosive sublimate and seventy-five grammes of common salt in a kilogramme of distilled water. The cattle treated had developed the disease between forty-eight and twenty-four hours previously, and their temperatures varied from 106·7 to 104·9 Fahrenheit. With the solution five injections were made into the big vein on the right side of the animal's neck, the first consisting of thirty cubic centimetres of solution, the second of fifty, the third of seventy, and the fourth and fifth of 100 cubic centimetres each. Within a maximum period of ten hours, the temperatures of the animals thus treated fell suddenly four or five degrees Fahr., but afterwards began again to rise. A second injection, however, sufficed to conquer the fever, and to maintain a normal temperature. It is noteworthy, too, that none of the cattle thus treated have suffered from those after-effects of the disease usually noticeable four or five months after an ordinary cure. As far as can be at present ascertained, the corrosive sublimate treatment is free from drawbacks of any sort, while, on the other hand, it has regularly given 100 per cent of cures. Dr. Guzzi does not, however, dispense with other medicaments in treating the local manifestations of the disease, but recommends that during and for some days after the cure external sores be washed and the feet bandaged with cloths soaked in naphthaline.

GENERAL ITEMS.

In his recent report on the grants for Agricultural Education and Research, Major Crenjie estimates that the sum devoted to the County Councils in England and Wales for the year 1899-1900 was roughly something like £77,000, and that including the grants distributed by the Board of Agriculture and the payments made by the Board of Education for instruction in the principles of Agriculture under the scheme of the Science and Art Directory, the total amount of public money in England and Wales applied annually for the purposes of agricultural education is between £85,000 and £90,000.

The following analyses of genuine rice meal and rice husks made by Dr. Augustus Voelcker are interesting:—

	Genuine rice meal.	Rice husks.
Mixture	10·30	12·53
Oil	8·52	1·40
[1] Albuminous compounds	12·93	4·94
Starch, digestible fibre, &c.	54·39	28·95
Woody fibre	4·76	33·52
[2] Mineral matter (ash)	9·10	18·66
	100·00	100·00
[1] Containing nitrogen	2·07	0·79
[2] Including silica	2·90	14 67

A correspondent writing to the *N.S. W Gazette* says:—Shows as now held have a tendency to momentary interest and are not the educational factors they should be. These Shows should be looked upon as schools for the dissemmination of education. The comparison of notes and ideas cannot but have an effect advantageous and beneficial to all concerned. The success of a Show depends principally on having a good display of exhibits and good judging. . . . I have always advocated the single judge system, and still hold that opinion; in fact, when asked to judge at Agricultural Shows, I object to take office unless the appointment be as a single judge. As to the question, should judges give reasons for their decision, the answer is, yes. The good judgment of the Committee should direct them either to affix a card or make the remarks known through the press. Undoubtedly the judges' work should be made public. I have known both these methods followed and with good results. Until something of this kind is done Agricultural Shows will not be the educators they are intended to be. If the judges are well paid (and they ought to be) they should have a perfect knowledge of their work and do it thoroughly.

Vinegar is the produce of oxidation of alcohol,

Alcohol is made from sugar, and sugar from starch; hence any fruit, vegetable, or grain containing starch (and they all do contain one or both of these) can be used for the manufacture of vinegar. The acid property of vinegar is acetic acid, diluted with four or five times its bulk of water. Acetic acid is not found in Nature, but is the result of several processes called fermentation. For instance, take corn meal, mix with several times its bulk of water, boil for a short time, pour into an open vessel and set it in a warm place and fermentation at once begins. The starch is converted into sugar and the product may be distilled or decanted off and will be what is known as sweet beer. This first fermentation is called the "saccharine fermentation," by which the starch is converted into sugar: the gluten in the grain acts as a ferment (*i.e.*, a yeast). Now, if this solution be undisturbed it will take on a second fermentation, called the "vinous (alcoholic) fermentation," whereby the sugar is converted into alcohol. If this compound be again let alone it will undergo a third fermentation, called the "acetous fermentation," whereby the alcohol is converted into acetic acid, which, as already said, is the acid property of vinegar. If this in turn be let alone it will undergo a fourth fermentation, which is called the "putrefactive fermentation," and is destructive. When the compound has reached the vinegar stage it must be decanted or strained off into a clean vessel and kept from contact with the air to prevent the putrefactive fermenation setting in.—*N. S. W. Agricultural Gazette.*

The system of exposing to the air wine which it is intended to convert into vinegar is all right until the vinegar is obtained; but after this it is a mistake to still leave the bung of the cask open and to still keep the vessel in a warm place. The *Mycoderma aceti* is the bacterium responsible for the transformation of alcohol into acetic acid, and by a process of oxidation of the former, for which air and a certain degree of heat are required, viz., from 86° to 90° Fahr. When the vinegar is strong enough, if the said conditions of exposure to air and heat continued to prevail, the bacteria referred to will decompose the acetic acid into water and carbonic acid, which is a further process of oxidation. That is why the correspondent's vinegar, good at first, is now a flat and nondescript liquid, which will very soon putrefy. Once the vinegar is made it should be racked and filtered or clarified; then the bung should be hermetically closed and the vessel stored in a cool place. Filling up with wine should not be omitted. This is done with the view of preventing any access of air, which at this stage is no longer required and is even detrimental. For fixing, either kaolin or Spanish clay should be used, never any isinglass, white of egg, or gelatine, which would make the vinegar more turbid. Four ounces of kaolin or Spanish clay are enough for one fixing of a quantity of 20 gallons.—*Ibid.*

D. E. Hutchins writing to the *Cape Agricultural Gazette* says:—In the Algerian *Bulletin Agricole* of the 15th May, 1891, is described a sun motor which is in successful use at Los Angeles in California. It is the result of a series of costly experiments which have been in hand for some years past under some Boston capitalists. This machine develops a ten horse power. It is hoped that certain improvements will bring it up to 15 horse power. It works a pump which yields 62·20 hectolitres of water per minute. The heating power of the reflectors is shown by the fact that copper placed in the focus of the apparatus melts in a few seconds, and a bit of hard wood lights like a match. The great reflector has a diameter of 10·55 metres, the whole surface being covered with 1,800 glass discs. The apparatus is automatic, and follows the movements of the sun when once started. It is hoped to utilise this machine in pumping water for the American railways in the deserts where fuel is as scarce as water. In 1889 I saw a similar machine at work at the Paris Exhibition.

The abandonment of blinker on horses is being advocated through the London press. Already their use has been discontinued to a great extent by Railway and Tramway Companies and by carriers.